PROGRESS REPORT

OF

FOREST ADMINISTRATION

IN THE

PUNJAB

FOR

1877-78,

By B. H. BADEN-POWELL, Esq., B.C.S.,

CONSERVATOR OF FORESTS:

WITH A REVIEW BY THE LIEUTENANT-GOVERNOR

AND

ORDERS BY THE GOVERNMENT OF INDIA.

1879.

CALCUTTA:
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8, HASTINGS STREET.

No. 447 F., dated Simla, the 26th May 1879.

From—A. O. HUME, Esq., C.B., Secretary to the Government of India, Department of Revenue, Agriculture and Commerce,

To—The Secretary to the Government of the Punjab.

I AM directed to acknowledge the receipt of a Resolution by the Government of the Punjab, No. 27F., dated the 15th January last, transmitting the Forest and Arboricultural Reports for 1877-78, and containing the orders of His Honour the Lieutenant-Governor thereon. These reports have been received so late, that they have to some extent lost their interest, and it will now be convenient to defer orders on certain matters until the Report for 1878-79 has been received, which it is hoped will be submitted punctually on the prescribed date, *viz.*, the 1st September next.

2. It is not necessary now to enter upon a discussion of the circumstances which have delayed the demarcation of the areas proposed to be permanently maintained as forest in the Punjab, and the settlement of the rights and privileges exercised in those areas by the agricultural population of the vicinity. That there has been delay in this respect is not disputed, but there appears no reason to doubt the opinion expressed by His Honour the Lieutenant-Governor that, under the circumstances of the case, it was unavoidable.

3. The Governor General in Council cordially assents to the remarks recorded in paragraph 8 of His Honour's orders regarding the necessity of taking steps to guard against the increasing damage done in several of the submontane districts of the Punjab by mountain torrents, and generally against the denudation of the hilly districts in the Punjab. The first step in this direction is to obtain control over the areas which comprise the head waters of these streams and mountain torrents, and of such other areas as may be threatened with denudation. Where Government is the proprietor of such land, or has certain rights in its produce, no time should be lost in declaring them reserved or protected forests under the Act, as the case may be; and where Government has no proprietary or other rights, the provisions of Chapter VI of the Act will enable the Punjab Government to take such action as the circumstances of the case may require.

4. The statement showing the area of the forests, classed as reserved forests, though not so declared under the Act, corresponds in its opening balance with the statement appended to the Report for 1876-77. This is satisfactory. At the commencement of the year the area aggregated 3,783, and at the close 3,791 square miles, the difference being due not to areas having been added, but to corrections having been made, which are explained in the column of remarks. This is as it should be.

5. The area of separate plantations, and the outlay incurred upon them, are recorded as follows:—

	Area in acres.	Outlay. Rs.
On the 1st April 1877	... 13,810	6,24,501
Additions	... 1,610	75,754
On the 31st March 1878	... 15,420	7,00,255

The area at the close of the year is in the return erroneously entered as 15,415 acres.

The statement of receipts and charges on account of these plantations, recorded in paragraph 159 of the Report, does not yet show any considerable increase under receipts. But the thinnings of the Changa Manga Plantation are now beginning to be important, and the Conservator thinks they can be sold at remunerative rates. The details given in paragraph 142 of the Report, regarding the carriage to Lahore by train, and the sale at that place of 7,325 maunds

of thinnings in January 1878, have been read with interest. The results seem to have been as follows :—

	Rs.	A.	P.	Rs.	A.	P.
Price realised at Lahore per wagon load of 140 mds.		...		36	10	3
Cost of thinning	7	14	0			
Railway hire	12	4	4			
Other charges	11	13	2			
				31	15	6
Surplus ...				4	10	9

The surplus is small, but it was the first attempt, and there seems no reason to doubt that the Conservator's anticipations will be realised.

6. In the report under notice, the separate plantations are properly shown distinct from the areas operated upon in Rakhs and Forests, regarding which there must always be some uncertainty. Good work in this respect is reported in several districts; and the accounts given in paragraphs 10 and 64 regarding the sowing and other operations in the Pabbi Rakh, in paragraphs 73 and 74 regarding planting of Deodar in Upper Kulu, and in paragraph 91 regarding the work done for the improvement of the Rakhs in the Lahore district, are very satisfactory and creditable to the Conservator.

7. In paragraph 98, the Conservator recommends that he be permitted to procure seeds and plants of exotic trees direct. This is in accordance with the orders since issued by the Government of India in Circular No. 63 F., dated the 5th November 1878.

8. The financial results have been as follows :—

		Rs.
Receipts		... 6,83,710
Charges	A—Conservancy and works Rs. 2,58,949	... 5,17,166
	B—Establishments ... „ 2,58,217	
	Surplus	... 1,66,544

9. The Report is shorter than those of previous years, but it might with advantage be shortened further, by omitting injunctions to Divisional Forest Officers and remarks criticizing the action of Civil Officers in former years. Such passages, I am directed to observe, are out of place in an annual Progress Report, which is intended to be a record of the work actually accomplished during the year. This point was adverted to in paragraph 13 of the orders on the Report for 1876-77.

Govt. Central Branch Press, Simla,—No. 80, E., A. & C.—2-6-79.—350.

Proceedings of the Hon'ble the Lieutenant-Governor in the Revenue Department (Forests), No. 27F., dated 15th January 1879.

READ—

The Forest Report of the Punjab for the year 1877-78.

RESOLUTION.—The Forest Report for 1877-78 is presented in a more concise form than hitherto, yet entering into sufficient details; and the Lieutenant-Governor considers that it is an improvement in this respect on its predecessors.

2. The year under report is not remarkable for any important operations or new undertakings; but a great deal of excellent work has been done. The revenue shows an increase over the previous year of nearly a lakh of rupees, while the expenditure is slightly less; the prospect for the future is moreover good; and when demarcation has been completed and forest rights definitely settled, the Lieutenant-Governor has every reason to believe that the forest revenue of this Province will steadily and largely increase.

3. The question of demarcation is one of extreme importance; but this work has been necessarily delayed both from the paucity of officers competent to undertake it, and from a desire to await the passing of the Forest Act, which has now become law, and under which operations for reserving forests and for general conservancy will be much facilitated. Proposals are now before the Government of India for the appointment of a special and temporary demarcating staff of forest officers, with whom civil officers, conversant with settlement work, will co-operate in demarcating those more distant and inaccessible tracts which lie without the ordinary range of jurisdiction of the permanent forest staff A Settlement Officer of experience is now engaged in the determination of the village boundaries in the Murree and Kahuta Tahsíls of the Ráwalpindi District, preparatory to the demarcation of the forest lands there situated. The Jhelum demarcations are being undertaken by a Settlement Officer in co-operation with the Forest Officers; while in Hazára and portions of Kángra special agency will probably be necessary.

4. The Lieutenant-Governor agrees with the Conservator of Forests in considering the questions of demarcating forest lands, and the determination of the rights of the Government and the people to be of great importance; but there are many passages in the present report which seem to argue that the nature of the difficulties in the way of this work is imperfectly apprehended by the Conservator. With the energy and ability of Mr. Baden-Powell, the Lieutenant-Governor has every reason to be satisfied; and the province is much indebted to the intelligence and system which he has introduced into forest conservancy; while the principles which he asserts are such as entirely commend themselves to the Government. But some of his present observations, which it is not necessary specially to point out, can hardly fail to excite against the Forest Department that very opposition which is so much deprecated. The slow progress due to an insufficient staff; the conflicting nature of the claims involved; the overwhelming character of civil administrative duties; the natural sympathies which district officers feel for the people under their charge; all these natural incentives to caution and delay seem to be viewed by the Conservator as wilful obstacles, gratuitously placed in his way by prejudiced officials. Important as the work of forest conservancy is, it is still necessary for Mr. Baden-Powell to reflect that there is other work as important connected with the administration; and in forest conservancy especially is patience a virtue. Where a Department like this, of new origin, is intruded into a country where forest rights have been hitherto dormant or unknown, and where the value of land is largely increasing year by year, it is not only natural, but inevitable, that what the Conservator of Forests may consider the legitimate rights of Government will be denied or contested, both by the people who have suddenly realised what they did not before understand as their rights, and by district officers, who most properly temper their zeal for Government interests by a desire to reconcile with those the interests and contentment of the cultivating population.

6. That the energetic assertion of Government rights is proper in a Conservator of Forests, the Lieutenant-Governor does not dispute; but it cannot be expected that either the people or officers of other departments will view the subject from the Conservator's standpoint, and if he desires to be cordially assisted by either or both, it will be well to attribute the opposition, which he must inevitably meet, to disinterested and generous motives, and not to ignorance or ill-will.

7. During the year, the subject of the fuel-supply of military cantonments in the Simla Hills has received much attention, and the plan is now ready for both planting and conserving a sufficient area to remove the great difficulty in procuring fuel which is now felt in these places. This work will probably require an additional officer, who will also have general charge of the Simla municipal forests, which, though not extensive, are valuable from their situation.

8. An important subject has further engaged the attention of the Lieutenant-Governor, in the increasing damage done to the Jullundur, Hoshiarpur, and probably the Umballa Districts by mountain torrents. These streams year by year are enlarging their beds, and converting a great portion of what was formerly arable land into sandy waste. The Conservator has submitted a most interesting report on this subject, which has been separately printed; and Mr. Coldstream, Deputy Commissioner of Hoshiarpur, has also paid great attention to the subject, and there seems to be reasonable ground for believing that the growth of these sand torrents, locally named *choas*, can be kept within limits, and their present extent reduced by judicious planting of the Lower Sewalik Ranges, and by the formation of embankments and plantations along their beds. The Lieutenant-Governor does not understand the meaning of the Conservator in his statement, in the 15th paragraph of his report, that he has failed to obtain any recognition of the principle that forests must be preserved all along hill ranges, at the sources of ravines and torrents; that such forests must be preserved to prevent the otherwise inevitable denudation; and that unless this be done, the injury from hill torrents will, year by year, increase. So far from this vital principle not having been accepted by the Government, it has been asserted and reiterated with great emphasis; and, as the Conservator appears to have overlooked this fact, it may be well to repeat the observations recorded in the Review of the Forest Administration Report for 1875-76 :—

"In the hills there comes into play a new set of considerations. It is well-known that on mountain ranges there are certain situations where forests have a value to the large and lasting interests of a country, altogether independent of the amount of annual yield. It is unnecessary to say much on this subject, which has been treated with professional skill by Mr. Baden-Powell in his recent pamphlet on the demarcation of the forest area in districts containing hill and mountain ranges, to which the attention of Commissioners and Deputy Commissioners in hill divisions and districts is invited. His Honor would not here refer to the most elementary rules of forest conservancy in mountain ranges were he not convinced by recent correspondence which has come before him that too many District Officers are either unacquainted with, or have forgotten, the simple principle that since steep ridges and the basins and courses of mountain streams are subject to the destructive influences of storms and torrents, unless protected by verdure and woods, cultivation in such localities is rarely lasting,—the soil of the bare hillside or ravine being carried away in *detritus*, whilst the streams, changed by denudation into torrents, sweep down to the plains, rocks and boulders and sand, which may reduce cultivitable areas to unculturable waste. The neglect of this principle, by felling or firing forests in the wrong places, tends directly to reverse the normal progress of society; because it involves the retrograde change of cultivators into herdsmen, the hills, by their loss of soil, becoming ultimately useless for every rural purpose but pasturage."

9. A new lease of the Bashahr Forests has been executed, and there is no doubt that its provisions will be more satisfactory to the Rája, his subjects, and the British Government; but there seems to be considerable opposition among certain classes in Bashahr to the forest work there undertaken, and

the Superintendent, Hill States, will have to watch the operation of the lease with considerable care. In order to assist him to do this, and to enable him to receive early reports of cases, ordinarily beyond the knowledge and jurisdiction of civil officers, the Assistant Conservator stationed in Bashahr has been appointed his Assistant for this and kindred purposes.

10. The question of fuel reserve is an exceedingly important one, and the Lieutenant-Governor trusts that any questions connected with it, and now waiting decision in the office of the Financial Commissioner, may be disposed of as speedily as possible. Until demarcation is completed, no large increase of revenue can be expected.

11. No detailed review of the present report is necessary; and next year the Lieutenant-Governor trusts to be in a position to report favorably of the measures which it may have been possible to inaugurate or complete under the Forest Act of 1878, the effective operation of which can, however, only be expected if the Government of India are in a position to strengthen in some important particulars the Forest staff of the Province. The small initial expenditure which this would involve will, the Lieutenant-Governor believes, be soon recouped in increased forest revenue and in the greater contentment of the people, to whom the present undecided condition of forest rights is a perpetual source of irritation.

ORDERED.—That this review be printed and published in the *Punjab Government Gazette*, also that copies be furnished to the Secretary to the Government of India, Department of Revenue, Agriculture and Commerce, the Conservator of Forests and the Financial Commissioner.

By order of the Hon'ble the Lieutenant-Governor,

LEPEL GRIFFIN,

Secretary to Goverument, Punjab.

Printed at the Punjab Government Civil Secretariat Press, Lahore.—24-1-79—481

FOREST ADMINISTRATION REPORT 1877-78.

CHAPTER I.

GENERAL SUMMARY.

Endeavour to shorten the report.

1. I shall endeavour to make this report shorter than its predecessors. This is not only necessary on the score of printing expense, but at present the chief interest centres on the work of settlement and declaration under the new Act. Till that is accomplished, detail about the administration of forests whose protection is uncertain and whose reproduction is not secured would be premature. All effort is being directed to this question, though it is to be regretted that the very great delay which attends the settlement of these matters makes progress slow.* At least 8 important cases affecting forest settlements are still pending.

JHELUM DIVISION.

New regulation for Hazára forests.

2. The Hazára reserved regulation has now been completed and is before the Government of India. The object is to secure the proper treatment of the village forests, which have received no attention hitherto.

3. The reserves continue unchanged; but already proposals have been prepared for extending the area of the Military Stations. It is much to be regretted that the cases of settling the boundaries of Natiágali and Thandiáni, long ago submitted, are still undecided. (Case submitted in 1876).

Working plans for Hazára.

4. Mr. Vincent continued the working plan of the Dungágali forests; when this was closed he was temporarily in charge of the Rawalpindi division, but continued a working plan for the Khánpur rakhs, which are at present (though inconveniently so) in the Jhelum division. It is intended, on submitting the plan for sanction, to ask the transfer of these rakhs to the Rawalpindi division, to which as regards their utilization the case must properly be attached.

RAWALPINDI.

Conservancy wanted.

5. The plains rakhs remain unsettled. So far as the restoration of the pieces to certain villages proposed in 1875 by Captain Wace are concerned, these have been sanctioned; but the orders are wholly silent about the forests, and the district officers still continue doubtful whether any rules or law apply, and with the exception of two or three small tracts more are being conserved. A precarious supply of fuel at high prices is kept up to the cantonments. This will very soon come to an end, and there is little or no reproduction. The repeated efforts on my part to get these forests put on a proper footing have been wholly without success.

Difficulties to be contended with.

6. A ruling of the Chief Court, afterwards corrected by a printed slip (which is passed without notice) has introduced great confusion. Added to this, a great scarcity of grass in October 1877, produced an order to throw open even the few acres of reserve we are allowed to keep.

In the hills the prospects are slightly improved. The Revenue Survey is advanced; and it is probable that a notification for forest settlement will shortly issue.

FUEL RESERVE—NORTH.

Rakhs in plains only need to be notified.

7. There is nothing required in this division but to complete the boundary demarcations of Shahpur plains and Gujrat rakhs, and to declare them reserved forests. It is not pretended that any rights exist in these rakhs, and I am not aware of any difficulty which should prevent this declaration.

The salt range.

8. The Jhelum rakhs, including those of the salt range (part of which is in Shahpur), have been less fortunate. Originally laid down on paper, the boundaries were found in practice unsuitable, and the result has been a fruitless struggle on my part to get conservancy measures introduced against the civil authorities, who profoundly disbelieve in the utility of Forest conservancy at all, as well as the possibility of improving the rakhs. At last, however, orders have been obtained for re-settlement of the whole range. A forest officer was anxiously waiting the

* It will not be supposed that I design to charge this delay on any particular officer, but it is to be regretted. The settlement of the Lahore rakhs, an extremely simple matter, involving only an answer to the question whether a series of 7 groups of rakh land, all the undoubted and absolute property of Government, should be set aside for real and active conservancy and planting, giving up the rest to grazing &c., has not yet (at the close of the 2nd year) received any answer. The consequences are deplorable. The whole of these rakhs were cut out in 1870 to 1874, and since then nothing to speak of has been allowed to be done to restore their fuel supply.

signal to begin, but no settlement or civil officer could be spared, so that the cold season passed away. This fact affords a strong argument for the establishment of a separate demarcation and settlement staff, not wholly composed of forest officers, but partly of civil officers.

Fellings hitherto restrained.

9. It is satisfactory to be able to add that, in this state of things, I have been able to prevent very extensive fellings of material, confining the supply to small local demands. In the existing state of things it is imperative to preserve and secure, not to cut or make revenue. At the same time I am well aware this cannot long continue. I have already received pressing applications for fuel fellings for the Northern State line.

Estate of Gujrat.

10. In Gujrat we have, I am glad to say, been allowed to close several rakhs, which have once been cut over for Railway supply. We have completely demarcated the Pabbi rakh, and also an inner or strictly closed portion of the same, and here *reboisement* operations are going on slowly and tentatively with a very small annual expense, it being most unwise to go into great expense for works, the success of which can only be secured, if I may use the phrase, by inches at a time. Situated on both sides of the Railway line, along almost hopeless ground, the results are already becoming visible from the carriage windows, and my confident expectation is that the results of the next five years will do more to silence the unpleasing objections I have had to bear from this division, than pages of argument. The work consists in careful protection of all natural growth, in sowing and transplanting *Dodonæa*, and *Acacia modesta* in plots, in treating the worst ravines with fascines, small dams, and dykes to carry off the water, and in sowing and planting all silt beds so secured

Chenab Division.

11. No remarks need be made. The forests are receiving rest and protection pending their final demarcation. Valuation surveys are being carried out meanwhile.

Ravi Division.

Demarcation in progress.

12. The work here most wanted is the demarcation and settlement of the forests. The Conservator with Mr. Pengelly visited the Bakloh and Kalatop group, and afterwards examined the whole of the Suil valley and determined the principle of carrying out the work. Since the year closed, Mr. Moir has been appointed to do this work.

Kálatop forest.

13. It is found that in the present depressed state of Dalhousie, the demand for Kalatop does not nearly equal the cutting proposed in the working plan. I have also found during my absence that the control books were neglected. All we can do is to continue to plant up the places wanting it. But large areas to be cut over must remain untouched. This can not be avoided.

Beas.

Demarcation work in Kulu.

14. During the whole year orders have been awaited on the Kulu report of 1876, but with consent of the local authorities, as much of the proposed demarcation as could be agreed to, evidently without dispute, was done. A good deal of deodar planting (to be noted presently) was done. Kángra was also visited preliminarily to start the work of a proposed demarcation in the Kángra tahsíl.

Forest for the same in Kángra.

15. The forest throughout this beautiful district *must* be taken care of. For a long time we had hopes of success on the principle of getting certain areas of forest in absolute control, and leaving others open. This plan must be regarded as a failure. It is true that a few very nice small forests have been obtained for Government, but these do not touch the safe condition of nine-tenths of the district. Nor does this in any way detract from the well merited commendations bestowed on Mr. Duff. What was done was well and very admirably done, but it has reached a small portion of two tahsíls, Núrpur and Dehra only. It is obivous that something must be done for the rest of the district, and for those parts of the tahsíls dealt with already which are at present unprotected. The principle must be (for there is no other possible) that forests must be selected and *kept* as *forests* all along hill ranges at the sources of ravines and torrents. If this is not available for Government reserve, it must be assigned to villages, and if *need be*, the whole revenue given over: but in any case *forest must be preserved*, or the stony beds of torrents (already far too numerous in this district) will spread devastation far and wide.

I have not unfortunately been able to obtain any recognition of the principle, but I have received what is perhaps as good, a permission to propose a demarcation of Kángra, and I hope the other tahsíls will follow,—at all events here is a work for the demarcation staff for many seasons to come.

Sutlej.

New lease of Bashahr.

16. The only thing here requiring notice is the fact that during the year a lease has been negotiated on a revised footing with the Rája of Bashahr. This will result in the abolition of all anxiety to effect cuttings to make up a certain revenue. The forest will be gradually and cautiously demarcated. This must be done not ostentatiously as a *forest* demarcation; but when, for instance, application is made for extension of cultivation, advantage must be taken of the opportunity to demarcate the whole of the line between the forest and the area which may be cultivated: thus the people will see that the demarcation has been in *their* interest as well as in that of the forest, showing them where they may cultivate at will without fear of interference.

17. I wish to place on record my hope that my action in this matter will not be hastily judged. No complete copy of the lease as drafted by me (and ultimately accepted) has ever appeared, consequently the whole matter looks as if my strong objection to the first revised lease prepared during my absence was captious. It is no disrespect to the officers who in 1875, drew the lease to say, that they could not be as well acquainted with the matter as I was. The Commissioner was invited to adopt my revised lease if he chose; and he did so. I may add that it is chiefly owing to the constant interest taken in this important matter by Captain Parry Nisbet, the Deputy Commissioner of Simla (to whom I am under the greatest obligation), that this lease has ultimately been signed.

At last signed.

18. The Pathán jágírdárs who share with Government the right to the Kalesar forest have raised a question about their rights and the matter is still before the Financial Commissioner. Hitherto these gentlemen, who have claimed (with more rigour than justice) their shares, have considered that they are entitled to the profits of a successful year, while no part of the loss of a bad year should go against them. It must be remembered that two matters are separately waiting decision: (1) the exact rights of these Khizrábád jágírdárs to share the proceeds of the forest; (2) the landowner of the forest itself with reference to some neighbouring estates. These matters, it is hoped, will be finally settled in the course of the land revenue settlement now about to commence.

Kalesar shareholders.

Fuel Reserve—Central.

19. The whole year has been taken up with steps for settling the area of reserves, and proposals have now gone in for nearly all the districts; but pending the settlement of these areas, conservancy is at a stand-still. Commencing with *Lahore*, it should be borne in mind that the whole of the rakhs have been cut over for the heavy Railway demand since 1870, and that little or nothing has been done to restore the material. This is not in any way my fault; I have the outlines of a working plan ready, but it is no use doing any thing till the question of introducing proper conservancy is settled.

Settlement of a revised and reduced area of rakhs.

I have proposed that as the whole of the rakh area is not wanted, a selection should be sanctioned, and I have submited a map of 8 groups of forest which are to be reserved: the rest to be given back to the district, (not to be ruthlessly thrown open to cultivation, but to be available for cautious alienation). No one can pretend that there are any rights in the eight forest reserves, except some few recorded at settlement, which I have no desire to interfere with. Nor have I proposed to prevent grazing in *all* the forests. I have only claimed the obvious state right of declaring those closed which have been cut out, and which must grow up again. The mere fact that some neighbouring villages (who have chosen to cultivate for their own profit the large area of waste left them at settlement) are inconvenienced by such closing, does not deserve a moment's consideration. They must be content to let some of their lands lie over for grass or grow fodder, or stall-feed their cattle, or send them further off.

Lahore reserves.

20. *Gujránwála.*—A complete plan and demarcation report has been sent in in almost superabundant completeness by Mr. Wild since the year closed. This will be taken in hand very soon. The plan is based on a feature very carefully discussed between Mr. Wild and myself. We have definitely recommended that a large area of this circle, which we have called the grazing circle, be always open, and be worked chiefly as a grazing ground; the rest, which experience has shown to be capable of yielding wood to the markets, we have called "the wood circle," and fixed a rotation and order of cutting; this will have to be closed against grazing in serial order, and camels and goats are to be permanently excluded, as incompatible absolutely with fuel growth.

Gujránwála reserves.

21. The Financial Commissioner has defined the principle to our entire satisfaction, as to which the numerous boundary errors are to be decided, and nothing is now wanted but to demarcate the whole of the rakh system now established, which consists of interrupted trenches,—masonry pillars being used at the main angles. It is intended wherever possible to grow 'farásh,' 'kikar,' or some other hardy species on the spoil banks of the trenches.

Correction of boundary errors.

22. In *Amritsar* proposals have been made (which have been practically carried out as no establishment is sanctioned) to give up the few outlying rakhs, confining our attention to Nág, Sarai Amánat Khan, and Bahora, on the railway line, and giving over one useful rakh on the Beas Banks, to the Beas Division.

Amritsar rakhs.

23. The Lahore rakhs have since been given over to the plantation division, those of Amritsar being already attached to it. The Gujránwála rakhs will be attached to the lower Chenab. The Fuel Reserve Central (or as it must henceforth be *Southern*) Division, will then be conterminous with the Mooltan Civil Division, with the sole exception that a few tracts in Dera Gházi Khan will necessarily be added to it.

Changes in divisional distribution.

24. *Mooltan district.*—The great Sarai Sidhu reserves have been sanctioned, and will, I hope, be gazetted as reserves at once, there being no reason against it. The proposals for Mailsi and Lodhrán tahsíls of this district are also completed, but are still with the settlement officer.

Rakhs in Mooltan.

Montgomery rakhs.

25. In *Montgomery*, the reserves along the Railway have been surveyed and reported on, and as after a long delay they have been returned to me (with no specific recommendations, but also without objections, from the district officers), I hope now to succeed in getting the matter settled at an early date.

Plantation extension.

26. *Plantations.*—Hardly any remarks under this head are needed. The pressing question (although I fail to get its importance recognized) is, what to do for the Northern State Railway. We have given up the costly scheme of expropriating private land on the Chenab, and what I want to do is:

(1). To plant all available islands.
(2). To take care of all the rakhs in the north of Lahore.
(3). To plant all the available land in Gujránwála.

The first is being done. The second remains in abeyance, as before said. Work is going on under great difficulties at Báoli Lehná Singh, but owing to the lie of the country, it is impossible that any large area can have been worked without a system of drainage works, in connection with the Dêgh and neighbouring rivers, which would probably be very valuable as a sort of minor monsoon canal system, but is quite beyond the power of this department.

27. A promising tract of about 1,200 acres near Gujránwála was available for planting. Unfortunately, after 55 acres were successfully planted, the work has been stopped pending the unsettled question, whether the Gujránwála city, who wish for this land for grazing purposes, are to over-ride the larger and public claim. It is said that the Northern State Railway will burn coal. It is useless to surmise on this point, but it is certain that the use of coal on the line, even if found to pay, will not supersede the use of wood altogether, as is shown on other lines. Nor is there any doubt that fuel plantations, worked under the "stored-coppice" system, so as to produce both timber and fuel, would have wider usefulness than merely to supply the Railway.

General state of the forest question in Punjab.

28. The position of the forest administration may be briefly summed up in a few words. We have hitherto made progress that seemed to be promising. We have one by one got under our control (at least nominally) most of the forests. In some districts we got all we wanted or could get; in others, we got what we could, and no doubt at the time we did not sufficiently recognize the necessity of forests for the people and for the good of the country, as well as for Government, which is now forcing itself on our attention.

At first it seemed a very wise principle to say, "Take a portion for Government, and leave the rest to the people to do what they please with." But it has now become clear that in the Punjab this principle is frequently inapplicable, for the simple reason that there is not forest enough for the purpose. In very sparsely populated districts like the Central Provinces, for instance, the plan answers, because the large area left unreserved is naturally well stocked, the people are few, and their cattle consequently not numerous. The result is that the demand taxes the forest growth but slightly, the exercise of rights of grazing is too sparse and lightly felt to prevent reproduction. It is far otherwise in the Punjab. The area so called "unreserved" is fast disappearing: the demand on it is far too heavy, the grazing of cattle far too extensive to allow of reproduction, and the question becomes increasingly pressing,—What will the people do when this so-called "unreserve" has disappeared?

The case of Hazára is in point, although its condition is an extreme one. I am acquainted with no district in the Punjab, Bengal, or Burma, in a worse condition, or in which more unchecked and wanton destruction is allowed, but still it illustrates the point. A good series of "reserves" has been declared, but takes in a very small portion of the whole forest. Vast ranges of hills are thus left to what was called "unreserved forest," and the consequences have been deplorable. The population is too great, and the grazing too incessant, to make this system possible.

29. What we want therefore to put things on a sound basis is (1) an immediate declaration of forests like those of Lahore, Mooltan, Montgomery, and Gujránwála, about which rights are not really in any doubt, and a fair recognition of the main principles of forest economy there: that Government must have wood for its railways, and must close the areas of its own forest when cut, to reproduce the material taken: that no forest right can ever exist to such an extent as to prevent or endanger the reproduction and maintenance of the forest estate on which it subsists: both points are in practice denied every day; and this and nothing else leads to the differences between civil and forest authorities; (2) a demarcation and settlement of all the hill forests. If these things are done, the province will assume a satisfactory condition; if not, the sooner expenditure on conservancy is stopped, the better.

I have purposely said nothing about plantations; these will never do away with the necessity for conserving natural forest.

CHAPTER II.

AREA AND BOUNDARIES OF RESERVED FORESTS.

Area statements.

29. I beg to say that, as regards the statement No. 45 which accompanies this chapter, all corrections have been made in the *plus* and *minus* columns. Though I entirely disapprove of this method, it appears to be the one ordered: and that of course puts an end to the subject.

The statement opens with the area as shown in 1876, and the *plus* and *minus* columns shew the alterations, necessary to bring it into harmony with the facts as finally corrected,—*vide* letter No. 374 C. dated 26th July 1878, to Government of India, together with such subsequent alterations as really affect the area itself.

Jhelum Division.

Military and civil stations in Dungagali range.

30. It is to be regretted that the new settlement of the boundaries of Natiágali and Thandiáni has again to be reported a second year. This non-settlement means that some Rs. 700 of imperial revenue are yearly appropriated without authority to district funds.

The work of putting pakka pillars with numbers in place of the temporary settlement pillars is proceeding, and the attention of Mr. Sparling has been called to the completion of the registers in form No. 1, and the entry of the numbers on the map at the same time.

Island plantations unsettled.

31. The island plantation of Peraghaib remains unsettled. In 1873 a committee formally determined the area that the Military authorities were to have, and they have since encroached though this case was long ago submitted for orders, none have been received.

32. No changes took place in the general area, but such as are noted in detail in the table.

Rawalpindi.

33. The area remains the same, but the unchecked breaking up of land in the Murree and Kahuta forests can only be appreciated at settlement. Complaints of the destruction of pillars in the plains rakhs are constant, but until other rakhs are declared under the Act, it is hopeless to prevent this.

Chenab Division.

34. Demarcation has not yet been taken in hand. The forests are however not encroached on, owing to the scanty population, and the fact that most of them have natural boundaries.

Fuel Reserve—North.

35. The changes in area are most easily seen by the table. Losses by diluvion are one cause; also, the transfer back to villages for grazing ground, is the cause of loss in Shahpur and Jhelum.

36. The state of demarcation is unsatisfactory. Throughout the salt range the pillars will have to be changed on resettlement.

Demarcation in Gujrat.

37. In Gujrat the whole Pabbi hill range, a length of boundary of 60 miles, has been demarcated with 205 pillars costing Rs. 2-6 per pillar. The numbers have yet to be added, and the register to be prepared. Charcoal has been buried under each pillar.

In this district (in the Phálian tahsíl) rakh Sohâwa has been demarcated by trenches; also rakhs Bhiki and Chimu-Sahna. In the Gujrat tahsíl rakhs Dhúl and Mári were demarcated. The former does not admit of trenching; 84 masonry pillars were therefore employed. Mári was completed with 43 pillars in the same manner.

Work in Bhera.

38. In *Shahpur* plains (Bhera) the following rakhs have been completely demarcated by trenches:—

Bahwal.	Busál.
Bhallowal.	Pakhowál.
Rukkan.	Músa.

Mona.

The cost has been Rs. 11-13 per mile including patwáris' expenses. These rakhs are intersected with plots of cultivation, and the principle of action has been settled by the Financial Commissioner, whose orders are, that none of them represent rights. All will therefore be stopped, under the usual tenant rules, compensation for improvements (where there are any) being paid. In case any portion of a rakh is found to be very much cut up by cultivation. and it is not worth while to eject the yearly cultivators, the piece will be cut off. When this is done, the Bhera rakhs might be declared reserves at once under Sec. 34 of the Act.

The trenches have been 50 feet in length, with intervals of 150 feet between; depth 1½ feet, width at top 3 feet, below 1 foot. At angles, the trench is made with two arms indicating the angle. This is not so good as the simpler system,—one chain of trench and one chain interval.

Trench system.

39. I propose to institute a system of making the guards responsible for a certain length of spoil bank to be sown or planted with "farásh" cuttings or other species; small rewards may also be given for conspicuous success. The durability of these trenches, the cheapness with which they are made, and the ease with which they are repaired, renders the system admirable on level ground. Masonry pillars need only be added at triple junctions, or other important points.

Planting the spoil banks.

Ravi.

40. I have nothing to report on this head at present. Demarcation has just commenced.

Beas.

Kulu.

41. Though a good deal of demarcation was done in Kulu, it can not be reported on till approved of by final orders on our joint report.

42. In Hoshiárpur bamboo forests and Núrpur ranges, hard-wood posts 4 feet × 4 have been put up, and in Núrpur lines cleared from post to post. The other forests in Hoshiárpur (visited by me) have masonry pillars, but too far apart and not numbered; this will be remedied.

Demarcation in Hoshiárpur.

43. In the Derah forests reserved unders previous order, similar posts were adopted, but the forests of Kaloha, Garli and Gangot were not taken in hand, as it seems that they were claimed by the Raja of Jaswán, and the claim is not settled.

Demarcation in Kángra

44. The depôts at Haro, Nádaun, Naushahra, and Wazír Bhullar, as well as the Naushahra plantation (Malláwál and Bágarián blocks) were similarly demarcated. The latter plantation lost 128 acres by diluvion, and gained 53 acres.

Other works.

Sutlej Division.

45. I have no remarks to make beyond this, that the reserves (under better control than any other almost) ought by no means to be excluded from the table of reserves, merely on the ground that local circumstances have rendered it undesirable to put up pillars all round: all are demarcated *sufficiently* for present purposes by natural bounds, and a few marks, and some are fenced.

SECTION 2.—(A) PROTECTION AND OFFENCES.

Jhelum Division.

46. There was one case during the year of a theft or robbery by a forest guard, who broke open a cash chest, and stole the contents (399 rupees), as specially reported. He was convicted. A forester who gave him the key of the room in which the box was (and without which he could not have effected the robbery) has been dismissed, and a suit instituted to recover his security money for misconduct and neglect. To prevent the possibility of such an occurrence, I have now had an iron safe buried in masonry provided. It should be observed however, that both the room and the box were strong in the first instance, and had not the door been unlawfully opened in the middle of the night, the robbery could not have occurred.

Robbery by a guard.

47. The offences in the forest range are shown in the table. In Hazára, the administration of justice is as unsatisfactory as possible: the punishments inflicted encourage offences, as the people see that in the unreserved forest they can do what they please, and that in the reserves fire is regarded as a trivial offence.

Other offences.

The only remedy for fire is to stop rights, and I quite admit that there is a great difficulty in convicting individual offenders, but this difficulty will be at an end on the publication of the regulation, and the difficulty of proof causes the number of acquittals, a large number of persons being usually complicated in a case of fire.

The general state of things however may be judged by the fact that during the year 9,000 trees were openly cut "in unreserved" forest, and sold to *contractors* in defiance of the law, and without the least notice being taken of it. My letter on the subject has not been even favoured with an answer. I am not anxious to complain, but this state of things has a tendency to pass the limits of what can be borne.

48. The lower river cases are petty timber thefts, and call for no remark.

Rawalpindi.

49. I have to repeat, I regret to say, the observations of last year regarding this district. No improvement has taken place. Not the slightest notice is taken of fires, which have raged as usual.

Fires in the forest.

The following statement of fires has to be recorded :—

Date.	Range.	Reserve.	Locality.	Total area.	Area burnt.	REMARKS.
April 1877	Kahuta ..	Narái ..	Laitrár ..	24,362	1 acre.	Burnt in 1876-77.
June "	Rawalpindi ..	Márgalla ..	Kalinjar ..	24,362	16	ditto.
Do.	Murree ..	Seribari ..	Nandkot ..	10,750	30	ditto.
Do.	ditto ..	Patriáta Murat ..	Chalaura ..	9,814	41	ditto.
July	ditto ..	Lankot Jundote ..	Samli Kachut ..	12,934	7	ditto.
Do.	ditto ..	ditto ..	Awáni ..	...	7	ditto.
Do.	ditto ..	Náwal Khad ..	Jáwa Malot ..	2,182	1	ditto.
Do.	Kahuta ..	Narái ..	Bhathián ..	51,293	½	Damage to grass only
August	Murree ..	Sílah ..	Silah ..	628	4	50 P. L. burnt.
Do.	ditto ..	Lankot Jundote ..	Tumma ..	12,934	10	150 " "
Do.	ditto ..	Seribári ..	Mánga ..	10,750	50	1,000 " "
Do.	ditto ..	Lankot Jundote ..	Jumma ..	12,934	4,510	Damage beyond description.
Do.	ditto ..	ditto ..	Kuthar Manglota ...	...	4	Do. do.
Do.	ditto ..	Seribári ..	Saneo ..	10,750	...	Only 1 murla burnt.
Do.	Kahuta ..	Narái ..	Dera Danoi ..	51,293	20	Damage unknown.
Do.	Rawalpindi ...	Margalla ..	Nurpur ..	24,362	3	ditto.
September	Murree ..	Chak Nanuthal ..	Anguri Chaka ..	17,200	300	Burnt in 1876-77.
Do.	ditto ..	ditto .	Sánj ..	..	1	ditto.
Do.	Kahuta ..	Nárá ..	Mator ..	22,421	¼	ditto.
Do.	ditto ..	Narái ..	Dera Danoi ..	...	125	ditto.
October	ditto ..	Jantra ..	Jantra ..	11,775	100	ditto.
Do.	Murree ..	Kror ..	Ratai ..	9,603	½	Damage to grass only.
March 1878	Kahuta ..	Narái ..	Laitrar ..	22,421	3	Trees burnt.
Do.	ditto ..	ditto ..	ditto ..	...	80	ditto.
Do.	Murree ..	Dewal ..	Sihanna ..	3,958	4	ditto.
Do.	ditto ..	Patriata Murat ..	Waggal ..	9,814	60	ditto.
Do.	ditto ..	ditto ..	ditto ..	...	20	ditto.
				Total ...	5,398	

FUEL RESERVE, NORTH.

50. The offences generally remained at the same number as usual.

Offences by establishment.

51. Some members of the establishment, who combined to sell a quantity of standing wood in rakhs Perára and Drengan, were convicted and sentenced to six months and 3 months imprisonment with fines of Rs. 500 and Rs. 200 each. Other offences are petty, and call for no remark.

51. The forcible release of cattle being pounded is rather common in Gujrat, where the people generally are lawless. The forest guards in many cases dare not take the cattle, for they get no redress if assaulted, and the owners are ready to combine.

52. None of the other divisions call for remark. In the Beas a large number of cases are shown chiefly of unauthorized felling of chíl trees, which it is difficult to prevent.

(B). IMPROVEMENT OF FORESTS.

JHELUM DIVISION.

Peraghaib plantation.

53. I visited the Peraghaib plantation, and drew up a brief working plan for it with the aid of Mr. Lemarchand.

It is now confirmed that the soil does not suit shisham very well. This tree does not live beyond 20 years, beginning to die off and deteriorate at that age, but still it is of useful size, and developes a good deal of heart wood.

We have divided the whole island by main roads and smaller compartment lines, thus opening it more to a current of air, and obviating the risk of malaria to the station. The compartments are formed chiefly by age, according to the various plantings and sowings that had taken place in former years.

I have directed levels to be taken across the island, and am still of opinion that much might be done to improve the soil by a system of surface drains.

The natural growth of mulberry in this island continues to spread, and I propose to sow mulberry artificially in the older compartments of shisham, which will now be cut. The tallow tree (*Exœcaria sebifera*) is also spreading naturally.

Reserves opened during famine.

54. The Hazára forests were opened to grazing owing to famine, and it seems to have been forgotten by those officers, who are never tired of opposing conservancy in this and the Rawalpindi district, that had it not been for the reserves, and few closures we have been allowed to make, this resource would not have been in existence to alleviate the distress.

Working plan of Dungágalli Range.

55. The working plan operations in Dungágalli were delayed by difficulties with the native establishments, and having to train new men, but a number of sample areas were selected, and compartments fixed upon. Mr. Vincent has been warned against undertaking anything too elaborate. We want at first a preliminary plan especially enabling us to know how far we may remove existing mature and deteriorating material to meet the constant demand for the different Military and Civil Stations. All our plans require to be at present, made with two objects :—(1) To enable us to know what we can fairly take at once ; (2) to bring the forest into such a condition that, a few years hence, a more regular plan may be made. The work is hard, in places very hard,—the forest being precipitous, and there is at present a total absence of good inspection paths.

Mr. Vincent has been told that he will have to bring operations to a close this season, as he will be required to take charge of the plantation division next year.

Plan of Khanpur.

56. During the autumn and winter, when work in Hazára was at a close, Mr. Vincent officiated for Mr. Elliott, but undertook at the same time, to prepare a preliminary working plan for Khanpur: he has completed this, and more than once promised the report, which I hope very soon to receive.

Nurseries for the replanting of Dungágalli forest.

57. The continual drought of the year prevented much nursery work being done in the Dungágalli range.

Planting in Kagán.

58. In Kagán, I have been anxious since my visit in 1876 to encouraging to the utmost the restoration by planting of the magnificent hill slope of Málkandi ; the lower slope is fitted for growth of *pistacia* and *cedrela serrata*, the upper for a mixed growth of deodar and *P. Excelsa*. This place ought to be the favorite of the forest officer, and I have promised a reward of Rs. 100 to the forester as soon as the lower slope is reported stocked with *Cedrela ond Pistacia*. A commencement has been made, and I hope the divisional officer will always take the greatest interest in this fine slope till it is completely stocked.

Mr. Sparling's account is not complete ; he does not report that the road has been diverted as we agreed it should be, or that a strong fence of rough stones should be made, both of which works were agreed on.

RAWALPINDI.

Improvement in Rawalpindi.

58. The nurseries in Khairimurt (and indeed the whole forests for 2 miles, on the east side) have been fenced. Stone walls without cement are found to be best, as wood is so very scarce. Thorn hedges do not answer,—the stakes are always stolen, and high winds there destroy the loose thorns. The wall costs about Rs. 350 per mile, which is moderate and well worth spending.

In spite of the damage done by throwing open Khairimurt the results of closing are most satisfactory, the nurseries have been extended to 65 acres in all, but Mr. Elliott appears to include under nurseries, both those places which he keeps up to supply material for transplanting, and patches or beds sown and intended to be left as part of the work of forest restoration.

Two important results are however known. First, that Sanata (*dodonæa*) is invaluable for *reboisement* works, that frequently the seed sown one year, and not coming up from want of moisture, will come up the year following; also that phulahi (*Acacia modesta*) now largely used in the form of transplants, has to get over the first year with difficulty, but once nursed through that, it is safe.

The rakhs Kherimár [1] and Kawágarh, which are allowed to be closed, are improving, but Mr. Elliott has not attempted to protect these by stone walls. He will be authorized to do so, since protection cannot be thorough without these walls, and it is well worth the expense.

Success so far satisfactory; but area entirely inadequate.

59. I again however beg to call attention to the absolute inadequacy of these very small measures of conservancy to reproduce the material required. I again most urgently represent to the Government, the need there is of closing and reproducing more tracts than the three small places now enclosed. Nothing is wanted but an expression of the will of Government, that the supply of fuel for Rawalpindi should be better cared for, and now that the various tracts of forest recommended by Major Wace have been restored, the remaining state rakhs be efficiently fenced in and protected.

I have been urging this without success for the past 7 years, and the time has come when any refusal on my part to speak out strongly and clearly would be unpardonable. This is the more true when the State Railway are beginning to want fuel. The closing of the Márgulla range is the work which should be first allowed in furtherance of the object in hand.

60. Attempts to grow olive even on "the mount of Olives" (Kawá-garh) have at present failed.

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(1). This place is noted for the hardness of the rocky ground, which is nevertheless becoming fast clothed, showing how perfectly absurd are the doubts expressed as to the possibility of seeing the Rawalpindi rakhs well wooded. So bad is the soil, that the local name Kherimar, "the wearer out or destroyer of sandals (kheri)" has been given.

FUEL RESERVE—NORTH.

Work on the islands.

60. Most of the bela, or shisham islands in Chenab and Jhelum rivers were thinned in 1876, so that only a little work of this kind was needed in 1877.

Closing of rakhs and protection of the small *zizyphus*.

61. The great drought of the season caused a good deal of the small *zizyphus* to be cut, but it is well understood that this is not allowed as a rule, and the grazing leases are always sold without the right to cut it.

The closings reported in para. 85 of last year's report were not quite correctly given. Thes errors being corrected, the "closed" list for 1877 may thus be given :—

(*a*).—*Entirely closed.*

JHELUM	...	... Rakh Garát.
GUJRAT	...	... Dhúl.
		Marí.
		Bhachhar.
		Pabbi *reboisement* area.

(*b*).—*Closed against camels, goats and sheep.*

JHELUM	...	... Lehrí.
		Sagar.
		Mánki.
		Samarlwáli Ban.
SHAHPUR	...	... Báhowál.
(Bhera)		Bhallowál.
		Pakhowál.
		Busál.
(Khusháb)	...	... Kírí.

Gujrat.—All rakhs except Rasúl and the open tract of Pabbí.

(*c*).—*Closed against camels only.*

JHELUM	...	... Part of Nílí.
		Part of Tillá.
		Rakh Parera.
		Do. Drangan.
SHAHPUR	...	... Anga.
(Khusháb)	...	... Mardwál.
		Makrami.

Explanation of last year's para. 84.

With reference to the remark in last year's report. Behlolpur is a bela and closed as above stated, Vasu and Sohâwa were closed only in 1875, but were re-opened, except to camels, goats, and sheep.

Want of rain.

62. In this division, as elsewere, the almost total want of rain has retarded all reproduction, as well as nursery work. Still rakhs Marí and Dhúl show wonderful improvement, and many of the Sanatta sowings in Pabbi have since come up.

63. The value of closing rakhs as the best, if not only means of restoration, is established beyond a doubt.

Description of the work in the Pabbi.

64. The sowing in Pabbi extended over 1,300 acres at a cost, inclusive, of fencing, of Rs. 1,065. The Sanatta (*dodonœa*) succeeded in spite of the drought. Acacias of several kinds more sparsely. In consequence of this success, very large quantities of *dodonœa* seed have been ordered, and the sowings of it in 1878 will, I hope, be extensive.

The possibility of transplanting *Acacia modesta* has been established.

Upwards of 548 dams (barrages) making a length of 2½ miles, were constructed to extinguish miniature torrents in one experimental basin directly fronting the Railway: and all level and suitable places for sowing were surrounded with field-banks to retain the water: the whole cost of these works was only Rs. 430. The effect of them, though not yet tested by a regularly rainy season, has been good; and pretty heavy rain fell in the spring: the formation of silt beds and the discharge of the surplus water in a clear stream (not carrying down silt and stones) has followed almost universally.

I have every reason to be extremely pleased with the intelligent care bestowed on this work by Messrs. Moir and Reuther. We all went over the experimental areas carefully during the year, and discussed on the spot the measures to be adopted.

The work at present tentative.

65. I do not wish to give the impression that any vast success has been obtained. More years must elapse before much can be seen, except by the initiated, but the careful, gradual, and thoroughly examined work that has been done, deserves praise.

66. On the belas, 22 acres were planted with a mixture of "phuláhi," "shisham" and "siris" on bela Pindí Tatar, and 10 acres in bela Nath (both Chenáb). Two nurseries, one of 15 acres and one of ½ an acre, were laid out in these islands for future extension. A similar nursery of ½ acre was prepared in bela Kolowál (Chenáb).

Planting on islands.

Chenab.

67. No remarks have to be made. Until there is a possibility of demarcation (I hope this will be in 1879) protection and rest are afforded to the forests, and that is all that can be done.

Ravi.

68. It will be time to speak of this division when demarcation is complete. The few experimental plots at Dhaurí, Kalowal (opposite Teesu) &c., have succeeded wonderfully.

Method of naturally extending deodar forest.

Nothing more is required than to fence the scrub adjacent to a deodar forest, and the result is wonderful; in a short time the place is full of self-sown seedlings.

This work will be largely prosecuted as soon as the demarcation of each successive group or range is complete. The exclusion of grazing, with the aid of a little clearing, is *the* thing most needed.

Nurseries and planting at Kalatop, &c.

69. During the year I visited all the Bakloh and Kalatop group and the Siul forests. In the former, the Bára (closed) forest of P. longifolia has reproduced itself satisfactorily.

The artificial filling up of various compartments of Kalatop with deodar which is carried out year by year gradually, shows a standing success. There are also nurseries stocked with 6,000 walnuts. I much regret that the demand does not enable me to remove a number of over-grown pines in the upper compartments and substitute walnut.

Beas.

Fencing.

70. A good deal of fencing has been done, the detail of which would be uninteresting: telegraph wire was used chiefly.

Clearance of fires.

71. In the Pine forests (Kángra district and Hoshiárpur ranges) fire-protection by keeping paths clear of needles has been successful.

In Kulu, thanks to the favorable spirit displayed towards forest conservancy by the civil officers, fires are unknown.

72. In various forests villagers have been allowed to cut out *A. Smithiana* and to lop *P. excelsa*, in order to form the deodar in mixed forests.

Natural reproduction over small areas is good,—in fact the whole of this splendid forest country only pleads for proper demarcation of sufficient ones to meet the large local demand and the export. It is not enough to control cutting and collect fees,—we must be sure that nature is growing material as fast as we are taking it out; if this is not going on, to a sufficient extent, it of course follows, and requires no forest science to appreciate the fact, that the *capital* is being trenched on.

Method of growing deodar.

73. Blanks in the existing small "reserves" of Dungri, Danabial, Sial Biál and Dudlu, were restocked with plants from the upper or Monálí forest garden. The season, as I have had so often to remark, was unfavorable, but still results are good on the whole.

"*Reihen-cultur*," or method of planting closely (1 foot to 2 feet apart) in cleared lines, the lines being 15-30 feet apart according to height of jungle and slope and other conditions, is now our established method.

Transplanting is not now done with earth, but the plants removed with a fork from the nursery lines are carefully placed in liquid mud. They are then removed in *flat* baskets (conical "kiltas" are ruinous) with a little mud and a little grass. Plants taken more than a mile to Dudlu answered.

Rough conical caps of brushwood are found useful to protect young plants from excessive heat and frost.

Success in the lines.

74. As far as could be ascertained the average of the lines gives in a length of 100 feet:—

Daná biál	32	Plants success.
Siál biál	35	
Dudlú	40	(Mr. Wild did this).
Upper Dungri...	17	
Lower Dungri...	28	
Do. in old fields	44	

On the Parbatti, Mr. Minniken (who was deputed during the slack season of the plantation division to help) undertook the planting of 10,200 deodars in lines at 15 feet in the Soma-chalaon forest. These are thriving.

Sowings in prepared *patches* also in lines succeeded in Sandhár and failed in Blajdhar, Latúra, and Sotánú. I am convinced that sowings in nearly all these places will be quite unnecessary: the completion of fellings in groups, followed by fencing, will naturally restore them.

Forest gardens in Kulu.

75. Before concluding about Kulu, it should be mentioned that we have now true regular "Forest Gardens."

On the upper (over 6,500 feet) at Munáli, the other about 5,000 feet near Bandrol between Raisan and Sultánpur: this latter has recently been acquired: it consists of 4 acres and is neatly laid out and fenced: it is provided with water by a course from a neighbouring stream.

As Captain Lee has most kindly undertaken to look after this garden during the absence of the Forest Officer, it is now called "the Lee Forest Garden." What it contains will be seen under the head of experiments. The object has been to give a fair trial to species which though requiring a hill climate will not stand the almost alpine conditions of Monáli.

Work in the Kángra forest.

76. The forests in *Kángra* are becoming gradually improved as opportunity permits, but the work is small, and does not deserve any detail *till a proper demarcation of natural forest all over the district, whether belonging to communities or the state* has been carried out. Chíl is for superior in Hamírpur to what it is elsewhere as regards growth and reproduction.

In the *Dera* tahsíl 600 *sissu* trees were planted out in the forest with success. The cultivation of this species in these hills should receive great attention.

Some other sowings recorded failed from drought. I beg that the cultivation of kakera (*Pistacia integerima*) may also be persisted in. It is satisfactory to learn from Col. Stenhouse's report that nearly all the forests which come within the areas of the reserved tracts constituted by Mr. Duff, are now stocked. Some of the chíl has shown quite a remarkable growth.

In *Núrpur* Range, the sowings at Chitrial, where there is a permanent nursery and forest hut, all failed for want of rain. Since *Ac., stipulatá* sown in a moist place alone escaped. 200 transplants of sissú succeeded, and here also this species should be cultivated largely.

A large sowing in the Tattal forest (close to Chitril) in prepared patches over 25 acres failed for want of rain, as the seed germinated. It is remarkable that since rain has fallen, most of these patches have become re-stocked either from further germination of seed, or recovery of seedlings supposed to be dead.

Hoshiárpur forests.

77. I visited the Hoshiárpur forests in the autumn. Lohárá is most necessary to be preserved, but is a wretched forest: though the total absence of all trace of cattle and the untouched grass showed how well the reservation is observed: there is little or no soil. We can do nothing therefore but continue to preserve and allow the grass to decay on the ground, and in time to produce soil along with the pine needles. Till some soil is formed, reproduction by natural seedlings can not be expected, though much needed to replace the existing crooked and ill-formed growth.

I have recommended the demarcation, *between* the pillars, by banks on which to plant the *agave* which is abundantly formed here. Thousands of young plants can be obtained both as suckers from the old plants, and from the flowering heads where the seed germinates *in situ*.

SUTLEJ.

Bashahr.

78. In the forests, certain tracts prescribed in the working plan have been fenced, but too recently to show results. Nothing elsewhere calls for remark: natural reproduction will be chiefly relied on, and no fellings have taken place, nor will till 1879.

Kalesar—absence of fire and its consequence.

79. In Kalesar, an immense growth of sál seedlings has taken place. It happened to rain heavily during May and June, and consequently there were no *fires*. This fact speaks for itself.

FUEL RESERVE—CENTRAL.

Closing of rakhs.

80. A few rakhs have been closed, but the work is too desultory to need further notice till the regular reservation schemes for the various districts are settled.

Cultivating leases with condition to plant trees.

81. It is reported that 780 acres are still under leases with conditions of tree planting. Very, few seem successful, and I have prohibited any further extension of this method. It is adopted as a mere excuse for getting hold of land, and the tenants, after the most barefaced neglect to take any steps towards planting, consider themselves seriously ill used when after the harvest season they are lawfully ejected.

Plantation Division.

81. Under this section comes the main report of this division. Special Reports have been furnished with regard to the Peshâwar jhíl and Delhi plantations.

Thinnings at Changá Manga and their result

82. *Changa Manga.* The thinnings may be shown as usual in a table, valuable for record, and therefore given in full:—

No. of compartment.	Area of compartment.	Age of compartment.	Average height.	Average girth.	Out-turns of thinnings saleable.			Remarks.
					Area thinned.	No. of maunds per acre.	Total.	
7	77·05	10 years.	35′	1′- 9″	77·05	27·84	2145·61	
8	151·77	10 „	35′	1- 9	151·77	14·55	2208·48	
56	86·09	8 „	30′	1- 7	15·0	60·86	913·03	
57	115·70	5 „	22′	0-11″	115·70	10·77	1264·11	
58	103·04	5 „	22′	0-11	10·0	12·48	124·84	
61	103·05	5 „	22′	0-11	103·05	7·23	745·94	
62	116·29	5 „	22′	0-11	116·29	4·5	525·90	
63	130·95	5 „	22′	0-11	130·95	17·01	2228·80	
64	112·45	5 „	22′	0-11	112·45	18·75	2108·70	
75	140·39	10 „	35′	1- 9	140·39	34·05	4780·43	
76	93·33	10 „	35′	1- 9	93·33	28·20	2636·36	
90	17	5 „	22′	0-11	17·	3·5	60·00	
91	17	5 „	22′	0-11	17·	36·12	615·10	
92	17	5 „	22′	0-11	17·	47·36	804·54	
93	17	5 „	22′	0-11	17·	36·78	625·02	
94	17	5 „	22′	0-11	17·	58·32	991·59	
			Total		1150·98	...	22978·45	

All material over 1″ in diameter is cut in 5 feet pieces and stacked. A quantity of twigs and branches was made into small faggots for experimental transport to Lahore.

Natural growth of mulberry.

83. The natural spread of mulberry as an under growth in this plantation, as well as in Ludhiána, Nág, Phillour, and Shahdara, continues, and thinnings are carried out expressly to favor this growth.

Failure of rain.

84. The year was one of extreme trial, as the rain failed and so did the canal.

In parts where the soil is bad, the trees actually lost their leaves, but have since recovered when water was available. This relates to the older or Vánkára circle.

New or Manjoki circle; present state of.

85. In the Manjoki or new circle there were at the close of 1876-77 2500 acres as following:

600	acres	sissu	4 years old
940	„	jhand	2 „ „
960	„	sissu and mulberry ...	1 „ „

The jhand area (of the above) partly failed from drought, and only 500 acres can be counted success. The rest suffered, but was restored by a subsequent spring watering.

Addition of the year.

86. The year's addition consisted of:

Sissu	660 acres	Lines @ 15 feet apart.
Mulberry and sissu in alternate lines	300 „	
	960 acres	

Of this 853 acres succeeded, and 107 failed owing to "kalr". Thus the blanks are:

		Failure.
Compartment No.	98	1 acre.
	99	2 „
	100	6 „
	101	10 „
	102	13 „
	103	5 „
	104	4 „
	105	4 „
	106	24 „
	107	35 „
	108	3 „
	Total ...	107 acres.

A nursery of *tamarix articulata* has been made to replenish these blanks.

87. I have omitted as uninteresting, the details of bridges, silt clearing, road making, and so forth.

The river plantations.

1150 acres now sown in Block I.

88. *Lahore Salaba group.* (I) Jhoko and Sadhanwáli block.

The trees are in satisfactory condition thus:

	Height	Girth.
Trees of 1870-71	= 38′	1′.6″—2′
„ of 1871-72	= 33′	1′.4″—1′—11″
„ of 1872-73	= 18′	6″— 9″

Up to close of last year, 1316 acres had been cultivated including this year's (1877) replenishing of 382 acres.

The failure of rains and floods in 1877 caused a failure of 200 acres.

Allowing for repairs (which succeeded) 1150 acres is the area now successfully stocked.

Block II.

89. (2) *Jugian, Shahdára and Mahmúd búti blocks.*

Shahdara. This group is far finer than the last. *Average* measurements show :—

		Height	Girth.
Compartment I.	Dominant	27′ ...	... 15″
	Suppressed	14′ ...	... 8″
„ II.	Dominant	28′ ...	... 14″
	Suppressed	13′ ...	... 9″
„ III.	Dominant	27′ ...	... 14″
	Suppressed	19′ ...	... 10″

Jugián.—This is the first growth with thick under growth of mulberry

Dominant	40′	24″
Suppressed	19′	12″

Mahmúd Búti.—Contains still 50 acres blank, unfortunately increased by 20 acres failure from the drought of the year.

The rest however is well established:

Trees of 1874-75	15′	10″
„ 1875-76	11′	5″

90. The growth in the *outlying plantations,* continues satisfactory.

Mr. Minniken reports as follows on the growth attained:

Nag.

	Girth.	Height.
Sissú	18″ to 24″	35′
Mulberry	12″ to 24″	30′ to 40′

Phillour.

Kíkar of 1869-70 on poor soil	Dominant	1′ to 1′—3″	18′
	Suppressed ...	9″	16′
Do. on good soil	... ...	1′—6″ to 2′	30′
Sissú		1′—3″	25′

Mixed growth.

Mulberry	1′—2″	Average height 40 feet.
Sissú	1′—6″ to 2′—3″	
Kikar	1′—0 to 2—3	
Phuláhi	0—6 to 1—″	

Ludhiána.

Sissú Dominant	1′—7″ to 2′—1″	40 to 45 feet
Sissú Suppressed	0—8 to 0—11	18 to 25 feet
Trees very close together in lines	0—11 to 2—2	25
Kíkar tree	2—1 to 2—6	40 to 48

Jagádhri.

Oldest trees	1′—6″	25′
Trees of 1874	0—6 to 0—10	16 to 18

Work in the natural fuel reserves to increase the yield.

91. *Rukh improvement.*—The work has first really been taken in hand this year. As the rakhs of Lahore generally have been (since this report) added to the plantation division, it is hoped the work will go on more systematically than ever.

At present it extends to Kot Lakpat, Baoli Lehná Singh, Kikránwálí and Chíchrá, the latter in the Gujránwála district.

Kot Lakpat.

Kot Lakpat has been formed into five compartments and "levelled." A rájbuhá with 9 tanks and Persian wheels for "lift" irrigation, has been completed.

110 acres of *kikar* nearly all failed from drought, excepting a sprinkling of survivors. 200 acres with *jhand* succeeded fully.

Báoli Lehna Singh.

Báoli Lehná Singh.—Of the 100 acres done in 1876-77, owing to drought, only 40 acres can be treated as success.

An extension of 1,389 acres was surrounded by a "bund" to regulate the flood.

This was divided into 8 compartments with roads, drains, &c., and 39 "Kachá" wells sunk.

In compartment I. 65 acres kíkar sowings failed during winter. In spring 200 acres were planted along the Bhed river with sissú, of which 50 per cent. succeeded. 220 acres were also planted by well irrigation, 80 per cent. succeeded.

In 20 acres of salt soil 8,000 holes were dug and filled with good soil, and sown with jhand and phuláhi, (success) 100 acres sown with the same species in patches. We have now completed;

	Acres.
1876.—Work	40
Nurseries	10
Jhand and phuláhi	120
Sissú transplants	180
Total	350

I inspected this place, it is in the drainage line, and the floods are the great difficulty. The water lying year after year in some places, has rendered the soil simply horrible and as hard as brick.

An experiment was made in endeavouring to pierce this layer by holes 3 feet deep and 2 feet wide. The small experiment has succeeded, but cost Rs. 26 per acre. The whole place could only be drained by rather extensive engineering works; but it is well worth considering whether the country could not be largely benefitted by reclamation of a large area, and by supply of water from the cuts which would form a sort of rainy season canal system.

Kikránwálí

Kikránwálí.—The whole area was embanked, and sowings failed for want of rain, but the holes will do again.

Chichra.

Chichra. After sinking 9 wells, enclosing 300 acres, and succeeding with *kikar* remarkably well over 55 acres, it is to be regretted that the work was stopped owing to a desire of the Gujránwála city to graze in this plot, one of the few available for planting for the Northern State Line. No decision has yet been communicated.

Lahore carob plot.

It may be well here to mention the little "Carob plot" at Lahore, the improvement of the soil having been rapid, we have now put out 250 carob trees, 50 of last year are from 4 to 5 feet in height, and there are various other trees. As soon as the ground is covered, thinnings will be made to give room to a nearly pure growth of *prosopes dulcis.*

It is remarkable that seed of this species sown in 1874 continued to germinate till 1877.

Further remarks on transports of thinnings.

92. I beg to refer to the chapter on yield and working, for remark on the thinning, and the experiment of transplanting Changá Mangá produce to Lahore by train.

EXPERIMENTS.

93. These will be dealt with by *species.*

Australian Acacias.—I had received a quantity of four species. *A. Dealbata, A. melanoxylon, A. decurrens and A. pycnantha,* some was reserved for sowing in the projected plantations for the Simla Hill cantonments, but smaller parcels were sent:

To Peragháib islands, Jhelum.
To Pabbi reboisement.
To Changá Mangá.
To Chitril (about 4,000 feet Kángra).
To Kulú.
To Bakloh.

These (by many seed returns) germinated fairly well at Peragháib in about 15 days, but I regret to observe that Mr. Sparling's report says nothing of this.

In the Pabbi, with the aid of shelter from the sun, a large number of all species succeeded, and are separately healthy.

On a bela in the Chenab, the same results, with better growth, are reported.

In Kulu (Lee Garden) they germinated, and will be reported on further next year, as they hardly come within the official year.

At *Chitril A melanoxylon* sown in July, was at the end of March 1878, 2½ feet high.

At *Changá Mangá A melanoxylon* was not effected by frost: there are now 380 plants thriving.

At Bakloh. *A melanoxylon* is growing well.

94. **Eucalypti.**—I received a great number from Australia, some of *E. Rostrata and Resinifera* from Lucknow, (which was not very good seed) and a number of varieties from the Inspector General. A great number, I find, have been reserved for mention in next year's report, as coming within the official year 1878.

At Changá Mangá, of the older trees, 212 are established, of these 136 range from 1 to 20 feet high, and 1″ to 10″ girth, 86 range from 20 to 64 feet high, and from 10″ to 39″ in girth. The largest growth has been 7 feet in height, and 10″ in girth in two years. At Nag 7 *eucalypti* have far overtopped all the indigenous trees. During 1877, the seeds received were in small parcels marked:

E. longifolia.: sown in autumn killed by frost.

E. paniculata.: germinated badly, Do.

E. pilularis.: 19 plants doing well.

E. virgata.: both seeds and leaves greedily attacked by ants, and plants destroyed in spite of precautions.

E. maculata.: all died.

E. crebra.: one only survived frost and is doing well.

E. longifolia.: (a second packet) 8 plants are succeeding well.

Nearly all were autumn sowings, and I take it this season is decidedly unfavorable. I should like to have several more of this species, in order to sow in spring and in the rains.

A regular garden for *eucalyptus* will be established in Changá Mangá.

Eucalyptus in Kulu.

95. In *Kulu*, Captain Lee took charge in his own garden (before the Lee forest Garden had been obtained) of the Inspector General's eucalypti. They were all sown in autumn, and only very few survived the winter. In future, spring sowings will be resorted to; the species were:

E. globulus. E. capitellata. E. Mt. Victoria. E. Stricta. E. Stellulata.

Since then, 17 species have germinated, and been placed in the Forest Garden, their mention belongs to next year. Most of these I received from a friend at Melbourne, a few came from the Inspector General.

In Manali garden we have some plants of *E. globulus*.

96. **Cork oak.**—At Pálampur there are 20 oaks alive from 5½-13-18 inches high.

I am sorry, that it was not known that transplanting there is always difficult. Their first growth is always of a long taproot, and unless planted in beds with a hard bottom, they cannot be easily removed. At Bandrol, in Kulu, there are 44 oaks but straggling in growth.

In Mr. Thedorè's garden at Dhobi there are five oaks, one is over 2 feet high, the others are too much shaded, and are only from 9″ to 1, high.

A more detailed special report has been submitted separately.

97. **English trees.**—I spent 50£ out of my own pocket, in procuring from my friends Messrs. Veitch & Co., a number (about 1,000) English trees. My principal object was the chesnut and English oak (*O. robur*), but for the sake of pleasure, I ordered a few ornamental trees.

I presented these, a few to a nursery in Jhelum division, and a number of trees are doing well at about 5,000 feet in the Khanpur hills, but Mr. Sparling has not noticed them, oaks and limes chiefly.

The rest went (1) to Kálatop, and (2) to Monali forest garden, and (3) a few to the garden of the little forest house at Ghoragali, (Rawalpindi Division).

The Kálatop ones suffered seriously by the necessity of unpacking the trees and placing in a shed, as the Kálatop forest was inaccessible from snow to a late season.

Success at Monali.

Commencing with Monali, we have now doing well:

26 "Scarlet Oak".	46 English Oak, *O robur.*
44 Turkey Oak *(O. cerris.)*	29 Tilia, Lime.
64 Common Beech.	11 Larches.
24 Mountain Ash.	2 Scarlet Horsechesnuts.
98 English Elm.	138 Spanish chesnuts.

I gave 3 larches, and 3 limes, to Revd. W. Heyde for Lahaul, where they are doing well. Subsequently a friend in Scotland sent me a large quantity about 7 pounds of fresh larch seed. About half was sent to Lahaul, and the rest has germinated well at Monali.

I again got for Monali 3 cases containing English ash and chesnuts, they were badly packed, and all failed but the ashes. My friends Messrs. Veitch and Co., have been informed, and will no doubt replace them for me.

In *Kalatop*, I have one "copper-beech" 3 feet high, a second was unfortunately broken down by some wild animal.

A number of the trees failed, *viz.*, all the larches, but as the trees were only budding when the report went in, all were not recognized. A number of oaks, limes, elms, and mountain ash are doing well, also the chesnuts.

At *Ghoragali*, there are now surviving 42 elms and 1 chesnut; and also (not yet finally planted out):—

68 Elms.	2 Scarlet chesnuts.
61 Oaks.	3 Limes.
21 Chesnuts.	66 Mountain Ash.

The beech and larch died.

Permission to continue a limited expenditure.

98. I cannot afford to continue this experiment, but I wish Government would allow me to spend a small sum yearly in getting out *Spanish chesnuts.* I spent only 50£ in getting all these trees to my own door at Lahore. Now this is less than a third of the sum spent on the carriage alone of large heavy boxes of chesnut seeds, (a large proportion of which were bad) sent officially.

It seems that this is unavoidable. In the first place, persons who like myself, take an interest in plants, have friends at home, who will really exert themselves to send out things, I being able to send seeds &c., in return to encourage them.

Next we have no commission to pay. When seeds are officially obtained at the Indian office, it is necessarily done through agents, whose charges for commission &c., are high, and who have no direct interest in really doing the work *con amore.*

Import would be limited solely to useful trees.

I should not of course think of getting any but practically useful species with public money, but the success of the chesnuts has been so great, that it would be worth while to allow us a small sum yearly to prosecute the work.

On the Sutlej.

99. **Spanish chesnut.**—The finest growth continues to be shown on the Sutlej. We have there from the seeds sent by the Secretary of State, 50 plants (one having died). At Kilba, one is 5 feet high.

Rawalpindi.

At *Ghoragali*, three plants 7, 11 and 15 inches high remain.

Kalatop.

At *Kalatop*, 4 plants are doing well, but not so well as the larger number which I got out as above related.

There is a tree still living in Mr. Watson's garden at Mádhopur, but it suffers from the sun.

At the Baloon barracks (below Dalhousie) 8 trees are doing well.

In Kulu.

The largest quantity are at Monali. Here (*besides* those sent by me) 368 plants are doing well.

Remarks on growth.

Forest officers will do well to bear in mind, that the growth of these trees is at first chiefly in the root, and it is probably not for 4 or 5 years that a great show of growth in the stem, is made.

100. **Other species at Changa Manga.**—Of miscellaneous species we have, *Acacia rupestris.* These have died out all but 25 seedlings which are looking sickly.

Prosopis pallida, the two remaining plants died.

Prosopis (Forbes) 57 plants all doing well.

Prosopis pubescens, 78 plants doing well.

P. Glandulosa, Texas, 116 plants doing well.

Platanus.—We have a number of trees, the largest being 18 inches in girth, and 20 feet high. What is called "*China blackwood*" from Bombay is doing well. I have 174 clumps each of 6 to 8 plants together, about 2 feet high. The Collector of Dharwar has kindly sent a large quantity more of seed.

Mention was made of sowing of chenár *seed* at Kalatop last year. As I feared, the seed failed to germinate. I doubt, though Chamba and Kashmir trees form seed, whether it is ever perfect.

Platanus *seed,*

ROADS, BRIDGES AND WORKS.

JHELUM.

101. The forest house at Changlagali has been completed. In Kagan, a low-level road has been made from Paros to Bunja. This was essential to the working of the forest, and I got the sharers in the forest (by the Deputy Commissioner's permission) to agree to give one-fourth of the seignorage to the work. It has cost about Rs, 8,000 altogether.

Road making in Kagan.

The Malkandi store house and enclosures has been completed; it is a strong stone building like a small fort.

Kagan store house.

RAWALPINDI.

102. Nothing calls for notice.

FUEL RESERVE—NORTH.

103. A small bungalow, which I have since inspected, was bought for Rs. 2,000 at Jhelum. An office was built on at a cost of Rs. 1,050.

Purchase of a bungalow at Jhelum

The Railway authorities have kindly made over to us a small bungalow near the Railway, situated in the centre of the Pabbi *reboisement* area. This is a great convenience.

One acquired in the Pabbi hills.

CHENAB.

104. Requires no remarks.

RAVI.

105. Ordinary repairs &c., requiring no special notice.

BEAS.

106. Various roads were repaired, and a timber road from Dhogi forest. 2 miles of mule road were made from Jibi to the Nághadhár forest.

Roads in Kulu and Seoraj.

An important bridge over the Parbati, between Phulgá and Manikarn, is being made by the civil authorities; we having contributed Rs. 500 and the deodar timber.

107. The bunds on the upper Beas to keep logs from stranding have stood well.

Bunds on the Beas.

The Kahunwán Jhil "bund" has also stood.

At Chitril, the garden hut was completed.

Several huts for forest guards were erected.

SUTLEJ.

108. The right bank road has suffered seriously from stones and earth brought over by the snow. Parts will have to be realigned.

Roads injured in Bashahr.

The Nachar house requires re-roofing. This will be done in 1878.

Other repairs were carried out. Several of the larger bridges required repairs.

109. The remaining districts do not call for remark. Forest officers generally are both careful and economical in building, and look well after repairs. Indeed, this is a branch of the work often better understood by many than technical forestry.

SECTION III.

Yield and Working.

Only one river regularly worked (the Kaghán)

110. Following the plan approved by Government only one river has been regularly worked, *viz.* Kaghan. On the Chenab and Ravi, small works, in clearing out what was cut before or dealing with wind-falls only have been pursued.

Reasons for this.

111. I am determined, as long as these forests have not been demarcated, and preliminary plan for their yield determined, not to allow desultory cuttings. Even where the age suggests cutting, it is not safe to trust to it, until the relation of the tract under observation to other tracts and to the question of the yield of the range generally, can be considered, at least in a preliminary way.

Local fellings on Beas.

112. On the Beas, the large local demand causes constant felling, and is a subject of grave anxiety: are we reproducing what we cut? At best we can only *hope* an affirmative, but the demarcation of the forest is the first step towards securing a proper answer. The only Government work is the continuance of Mr. Healy's scantling contract.

113. No work at all has been done in the Sutlej.

From the state of the forests, as a whole, I feel sure that we shall be well rewarded for this policy of abstention a few years hence. The work in the fuel forests, will be noticed in its place.

Jhelum Division.

Kaghán fellings.

114. The fellings in the year were: 702 deodar trees; they were made into 6,892 logs. There were on hand at beginning of the year, 387 trees felled, but not converted; these yielded an addition of 2,952 logs.

20 Pencil-cedar yielding 71 logs were felled as an experiment, in order to have this beautiful wood tested and supplied to the Industrial Art School at Lahore.

In addition to the above, 569 fallen deodars yielded 4,045 logs, and 489 logs were made out of drift timber.

Total logs obtained and launched.

Some logs remained also from last year, giving a grand total of 18,724 logs, of which 14,295 were launched, and on 1st April 1878, leaving 4,429 in the forest.

Demand in the Dungagullee range.

115. In Dungagullee range, the notable feature is, that leaf-bearing trees are sold and utilized which elsewhere are taken no account of. The despised *Abies Webbiana* is there one of the most valuable trees. *Ulmus species, prunus, acer,* and *pavia*, are all utilized. 494 trees were felled, and sawn up, yielding 33,453 pieces, and 7,34,400 roof shingles; of these all were sold but 706 pieces, and 54,750 shingles, the net profit being Rs. 5,500.

River work (Jhelum).

116. There were but indifferent floods, and the receipts at depôt were small.

2,622 logs reached Bághám, 303 logs reached "the islands," and only 133 logs reached Jhelum.

The per-centages of these, taking the whole together, were:—

Of logs previous to 1872	...	...	...	30·8 p. c.
" " of 1872	...	...	...	18·7 p. c.
" " of 1876	...	...	...	25·6 p. c.
" " of 1877	...	...	...	24·8 p. c.

The average cost of bringing to depôt is 3 annas a cubic foot.

Deodar gave an average of 32·7 cubic feet, and pines 19·9 per log. Average price obtained including pines was Rs. 0-10-4 per cubic foot.

The waif goes entirely to the Mahárája of Kashmir, who pays Rs. 4,000 annually.

Logs bearing double crosscut are identified by this fact as Government property, and are not waif.

Chenab.

117. I disregard the usual order of divisions for the sake of dealing with the rivers together.

Work on Chenáb.

The only fellings on Chenáb (besides a few pines and deodars granted locally) were of dead and wind-fall trees. Thus:—

	Logs.
387 dead trees	1,971
Wind-fall do.	6,037
Walnut do.	3
Pine do.	3
	8,014

All these were launched, but there are some pine logs of former years still in the forest.

Depôt receipts, Wazirabad.

118. The receipts at depôt were 3,566 logs, of which 232 were waif or unmarked. The chief species was deodar, only 3 pines, and 7 "fancy woods" being recorded.

The per-centage was thus:

Previous to 1870	0·4
" of 1870	0·6
" " 1874	0·9
" " 1875	1·0
" " 1876	15·45
" " 1877	81·64

Ravi.

Local fellings in Chumba state.

119. The grants for local purposes were as follows:

Deodar	251 to zamíndárs.
"	45 for state.
Chíl	88 chiefly for state.
A. Smithiana	27 do. do.

The Kálátop fellings for conversion and sale were:—

34 deodars, and 25 *A. smithiana.*

In the Bagota forest 250 dead and half dead deodars were cut.

In the Bhandal forests there were numerous wind-falls.

The total number of logs obtained to be launched for Government were:—

Bhandal forests	1,432 deodar
Ditto	33 pines
Bagota	1,667 deodar
Diur	1,013 deodar

Attention was paid to the slides; earth slides filled with brush-wood were employed.

State of river depôts.

120. The transit depôts were found to be encumbered with much timber, and were cleared out. A number of sold logs were found to be rotten, and some to have been carried away by floods, and hence the transit returns required considerable correction.

The waif receipts were large:

Shahpur	192 logs
Akrota	3,568 "
Trimmu	698 "

Per-centages of different years fellings, received at depôt, cannot be given.

121. The Ravi officer explains the impossibility of giving per-centages of former years' fellings, received at depot, as the years were not entered. Steps have been taken to remedy this for the future.

The depôt receipts (sale depôt) were:

	logs	Cubic feet
Deodar	6,076	= 1,02,076
Pines	1,290	= 17,464

The deodar received was of fair quality; the logs were mostly short—an average in cubic contents 19 feet.

Beas Division.

Local fellings.

122. Attention will not fail to be attracted to the continued enormous fellings for local purposes exhibited in the following table :

	Deodar.	Pinus excelsa.	Pinus longifolia.	Abies smithiana.	Abies webbiana.	Alder.	Sissu.	Toon.	Cypress.	Yew.	Walnut.	Chil.	Miscellaneous.	Total.	Remarks.
Sold to Zamindárs at reduced rates	19	...	...	...	...	...	4	...	...	...	...	1	...	124	The zamindári rates of royalty on these trees are Re. 1 for deodar, Rs. 2 for chil, and 8 annas or Re. 1 for sissu trees according to size.
Sold to towns-people	...	52	...	10	...	10	...	...	...	1	...	...	...	73	The price for towns-people for these trees, is 4 annas a tree.
Given gratis for Government works	112	355	...	66	7	27	...	33	...	...	...	...	50	650	
Ditto to the Rai of Kulu ...	...	10	...	...	...	400	...	...	...	...	3	...	...	413	
Ditto to Zamindárs	...	14,145	756	5,961	2,319	...	...	...	1	4	...	...	10	23,196	27 dead deodar trees, and 141 pieces of deodar, were also given gratis.
Total ...	311	14,562	756	6,037	2,326	437	4	33	1	5	3	1	60	24,636	

For Government.

123. The trees felled, and scantling prepared under Mr. Healy's contract, were as follows :—

Name of forest.	No. of trees cut.	No. of scantling sawn.	Remarks.
Satúrn	73	1,202	Fifty four of the trees cut were trees that had been brought down by the wind or snow. The scantlings are broad-guage sleepers 10′ × 10″ × 5″. The felling was done with the axe.
Blajdhar	518	7,007	
Solan	165	2,674	
Jibi	12	300	
Baguri	26	360	
Pokridhar	203	2,945	
Bokrialonal	73	2,071	
Nagadhar	369	4,107	
Total ...	1,439	20,666	

Launching.

124. The launching of timber was carried out thus :—

Name of forest.	15′ 10″ × 5″	12′ 10″ × 5″	9′ 10″ × 5″	15′ 5″ × 5″	12′ 5″ × 5″	9′ 5″ × 5″	5′ 5″ × 5″	Total.	Remarks.
Dhangi	758	808	1,884	5	30	...	1,027	4,518	Including some rejected scantlings.
Sandhar	95	344	2,798	16	22	95	5	3,375	
Total ...	853	1,152	4,682	21	58	95	1,032	7,893	

The scantlings were carried from the Dhangi forest to the banks of the river, but most of those from the Sandhar forest were dragged or slid down on earthen slide and conveyed along a large "kool" or irrigation channel. It was found however, that the ends of many of the scantlings were considerably injured by this mode of transport. Increased rates were therefore given for carrying the scantlings from Sandhar also. Small trucks, on low wheels, made by a mistry were tried for carrying the scantlings from these forests, but it was found that they did not answer even on level roads.

125. The receipts at depôt were:

Deodar in logs	382	12,468	cubic feet.
Pines do.	104	2,166	"
Scantling do.	383	1,388	"
Walnut do.	1	4	"

The waif logs were only 127 of all kinds, most timber was carefully caught and marked on the upper Beas.

126. Of import timber 745 rafts were examined. Excluding those pieces purchased from Government forests, there were 32,541 pieces, and nearly 112,000 bamboos taken down the river.

Traders' timber.

SUTLEJ.

Bashahr free grants.

127. The free grants to zamindárs have been:—

Deodar	65
Do. poles	165
Do. Pines	94
Do. Poles	1,200

128. The total of logs received at Depôt (there were no launching or works in the forest) were 3337 logs; everything was sold off but 31 logs of 446 cubic feet at the end of the year.

Ravi work.

Mr. Fendall believes that by the time the felling is recommenced (in 1879) there will not be a single piece of old timber anywhere in the river or islands; this will be very satisfactory.

The average size of timber was from 16-42 cubic feet, and was not of very good quality. Waif pieces were 500 in number.

Failure of summer floods generally.

129. On all the rivers, owing to failure of rains, there were indifferent floods. In some rivers there were however winter floods.

The remaining divisions deal with fuel sold in stacks, and other produce removed by permits.

RAWALPINDI.

Fuel sold in Rawalpindi.

130. The trees cut are shown in form 53; the miscellaneous products form, however, the bulk of revenue.

The Murree Brewery consumed 2,18,400 cubic feet of fire-wood alone.

131. Mr. Elliott has devoted a number of paragraphs to the subject of selling fuel by weight, which are neither necessary nor altogether reasonable. Sale by weight was abandoned long ago under sanction of Government, because the loss and disputes it leads to are endless. We paid a contractor for 1000 maunds, and when this was taken over by the Railway &c., owing to insects eating it and loss by dryage, we got credit only for about 560 maunds; how was the loss to be charged off? It is perfectly immaterial what the wood weighs. We sell at a fixed price a certain sized stack or heap of material, or a fraction of that heap. On first introducing the system it was necessary (in order to avoid any sudden change of rates) to compare the 100 cubic feet stack with the old weight, in order to fix the price: when once that was done, and a fair rate for 100 cubic feet fixed, no reference to weight was for the future needed. If a purchaser thinks the stuff badly stacked, he has the right always to throw it down: if he stacks it again in a smaller space, he is entitled to the costs of the operation; if not he pays them, but this is rarely or never necessary, if ordinary attention is paid to stacking.

Sale by bulk.

Our standard is a stack of 100 cubic feet.

There is a difference as *in value* between hard wood and soft wood; that is easily met by charging so much less for the latter. Where hard wood is Rs. 6 to the 100 cubic feet, soft wood might be Rs. 3-8 or Rs. 4 for the same, or whatever it is.

Uniformity is essential, and all forests now sell by a fixed stack.

132. The system must be uniform, and selling by bulk is far the best. If it is not it is strange that it should have been adopted by every forest country in the world with which I am acquainted.

Local grants in Murree and Kahuta &c.

133. The Government returns take no notice of what was given out to villagers. The utter recklessness which is shown is surprising.

One instance will suffice: in Narai forest up to middle of March 1877, 29 orders for 26 pines and 996 other trees had been given from the tahsil nominally for repairs. But up to that time not one single repair had been effected; the wood was sold, no doubt, after being gained under pretence of requiring it otherwise.

The following statement showing number of trees cut free of payment by villagers in Murree and Kahuta tahsils, under this department, by orders from civil authorities, is extracted from Mr. Elliott's report:—

Tahsil and Range.	Name of villages.	No. of orders.	No. of trees.		Remarks.
			Conifers.	Hardwood.	
Kahuta ...	100 Villages ...	317	263	9,773	Also 215 branches of chil trees
Murree ...	80 Villages ...	517	242	8,797	837 Do. Do. G. K. M. Also clearing new land 379-0-11
Total ...	180 Villages ...	834	505	18,570	

Here we have given away to villagers (who make a profit out of the greater part of it) a clear revenue from Government estates of over Rs. 20,000 in the year. Estimating conifers @ Rs. 5, the very lowest possible average, and hard wood @ Rs. 1 which is really too low, as many trees are included of Rs. 3-6-0 and even Rs. 10 value, and branches @ annas 2 each, we get :—

505 conifers @ Rs. 5	...	...	... 2,525	0	0
18,570 hardwood @ Rs. 1	...	...	... 18,570	0	0
1,052 branches @ Ans. 2	...	..	... 131	8	0
	Total due		... 21,226	8	0

This, without counting the trees, of which no estimate can be formed and damage done generally, on 379 ghumaos forest land cleared.

Fuel Reserve—North.

Fellings for fuel restricted.

134. This division has at present no regular fuel fellings. The fuel from Gujrat was all cut since 1870-1 for the Northern State Railway; for that in Bhera at present there is no demand, though there will be when the (ultimately inevitable) Railway branch extends there.

In Jhelum and the Salt Range, until re-settlement is affected, and some guarantee given that what is cut will be replaced by reproduction from closing, I will not allow cutting except what is locally unavoidable. A small quantity of material was sold from Rukh Paniála, as the land itself is not wanted for forest purposes. The only rather considerable sale of fuel, was of 1,072 phuláhi trees in Rukh Nílí, to meet an urgent demand.

Mr. Moir says there will be large demands next cold weather for the Railway. I can only say that they cannot be complied with. No tract will be cut, unless there is assured official permission to close it absolutely for reproduction, as soon as the cutting is complete.

Fuel Reserve—Central.

Last Rukhs cut in North Lahore for Railway.

135. For the Northern State Railway, the remaining resources of the Northern group of Lahore forests are cut.

Kanjríwála...	1,084 acres.
Bhagtera	2,333 acres (one half the area cleared).
Ratwána	(1,888) (1,200 cleared).
Bhagaur	(10,740) (one half cleared).
Madhodás	(2,732).
Bauli Lehna Singh	(8,914) all larger trees cut.

[It is *said* that these are all closed to grazing with the exception of Bhagaur.]

Kothala—Keekar above 2′ girth removed.

Commissariat cuttings elsewhere.

136. In the Lahore tahsil for commissariat want, Lakohoál (1,048) acres have been cleared. Grazing is excluded from 1st April 1878.

It will be interesting to note next year the realization of these "closures."
Baikúntha 4,478 acres (about 1,500 cleared).
Chúnían Rukh 1,078 acres (cannot be closed).
Mudkí 1,227 acres.

Fellings in Gujránwálla.

137. In Gujránwálla, the following were cut:

Káwánwali (5,216) cleared for S. Railway closed to grazing from 1st April.

Jhinda—Jhariana	(1,479 acres).
Hardomakki	(3,884 acres).
Lagar	(5,118 acres).
Hamoki	(2,726 acres).

Montgomery.

138. In Montgomery, in the nameless rakhs, a large area was cleared; the rakhs are only known hitherto by numbers, and these would convey no idea of the locality.

I trust however this is the last year that this old fashion will prevail: the forests are now surveyed and named.

Mooltan &c.

139. A smaller demand occurred in Mooltan and Muzaffargarh. In the former, in Serai Sidhú, the cuttings were allowed in those parts of the new reserves, in which we actually desire to get rid of the old degenerated growth.

140. Taking the whole cutting in this division, the yield in cubic feet is as follows:

	Acres.	c. f.	per acre.
Lahore cut say	32,000	4,52,000	14 cubic feet.
Gujránwála	12,500	3,80,000	31 cubic feet.
Montgomery	80,000	13,56,000	17 cubic feet.
Mooltan	4,000	96,500	24 cubic feet.

All this cutting is reported to have left a proportion of trees standing usually all under 10 inches girth.

The whole method of rakh working has been hitherto of the rudest description, and I trust that with the preliminary plans, a new state of things will begin.

Urgent need of action in the matter of fuel preservation.

140. The continued demand points to the necessity for great care in the reproduction of the fuel, but I see no sign of any official recognition of the necessity. When at the end of a few years, the dearth of fuel is seriously felt, it will be too late to regret that the "rakhs" were little so cared for, for owing to the price of land it must be borne in mind that we cannot afford entirely to do away with the rakhs as natural fuel resources, although the reduction of the area kept, and the improvement of the diminished area, so as to intensify the yield, must be constantly kept in view.

Plantation Division.

141. We have not reached yet the yield period; all cuttings are still "improvement cuttings." Nevertheless it would be inconvenient to include under any other head the observations which have to be made regarding experiments in coppice cutting, and regarding experiments in transporting the produce to Changa Manga by train to Lahore.

Experiment in coppicing.

An acre of 10 years old we cut for experiment in 1876. The coppicing was done in 4 methods:

A. leaving 2 feet high stool.

B. leaving 1 foot high stool.

C. cutting flush with ground.

D. cutting below surface.

The method A gives vigorous shoots, but this is on the same principle as pollarding, and it demands too great a sacrifice of material.

The method B was not so good. The method C is the best. D is practically a failure.

The following table shows the results.

A. 2 Feet stool.

No.	Most promising shoot.		Average shoots per stump.	Stump died.	Remarks.
	Girth.	Height.			
1	5"	11'-	*N. B.* These are all feet' and inches". 9'7" &c.		Growth of coppice vigorous, straight, and healthy.
2	3	9-7			
3	2	'8-4			
4	6	13-			
5	4	9-			
6	5	8-6			Average girth 4' 45"
7				1	Average height 10' 25"
8	3	7-9			
9	6	10-5			
10	6	11-5			
11				1	
12	5	10-6			
13	5	9-10			
14	6	10-6			
15				1	
16	5	13-3			
17	6	12-7			
18				1	
19	4	10-			
20	3	8-10			
21	4	10-5			
22				1	
23	4	11-9			
24	4	10-			
25				1	
26	3	8-6			

METHOD B.—Statement of coppicing from 1 foot stump.

No	Most promising shoot. Girth.	Most promising shoot. Height.	Average shoots per stump	Stump died.	Remarks.
1	2″	6′-7″			Very poor indeed, unhealthy and blighted looking.
2	2¼	11-			
3	3½	8-3			
4	2½	7-6			The mode of felling cannot be the cause of such miserable looking coppice.t
5	3	7-8			
6	3	8-7			
7	2	6-3	4		Perhaps bad ventilation may be the cause.
8	3	10-5			
9	2	8-4			The soil cannot be bad, as the standard trees around are good.
10	3	8-			
11	2	7-3			
12	2	7-6			
13				1	Average girth 2″—73″.
14	4″	9-			Average height 8—33.
15				1	
16				1	
17				1	
18	4	10-5			
19				1	
20	2½	8-8	4		
21				1	
22				1	
23				1	
24				1	
25				1	

METHOD C.—Statement of coppicing flush with ground.

1	3″	7′-5″			Although the coppicing is not quite so fine as from the 2′ stump, yet I recommend this mode of felling.
2	2	5-6			
3	3	6-6			
4	5	11-			
5	2	6-9			The shoots are better able to withstand wind, as they, in most instances, spring from beneath the soil.
6	2½	7-10			
7	1¼	4-10			
8	2	6-5			
9				1	The average height and girth is less than in coppicing from the 1′ stump, yet, this is far better, healthier, and more promising.
10	3	7-3	5		
11	5	11-3			
12	2	6-7			
13	2	7-			
14	2	6-3			
15	1½	5-			
16	2	6-4			
17	3	7-8			Average height 7′—5″.
18	3	5-6			Average girth 2—81.
19	4	9-5			
20	3	10-			
21	4½	9-5			
22	3	8-			
23	3	8-6			

METHOD D.—Statement of coppicing 1′ under ground.

1	1″	5″-			Most unsatisfactory; the shoots are mere twigs, and look suppressed and unhealthy.
2				1	
3	1″	4-3			
4	1	6-6			
5	2½	7-5			
6	½	4-			
7	2″	3-4			
8				1	
9	1½	5-9			
10				1	Average girth 1½″.
11	2″	7-3			Average height 5—9″.
12	2½	6-4			
13	2	2-9			
14				1	
15	3	9-5	4	1	
16				1	
17	1	4-7			
18				1	
19	2½	6-10			
20				1	
21	½	3-			
22				1	

METHOD D—*concluded.*

No.	Most promising shoot.		Average shoots per stump.	Stump died.	Remarks.
	Girth.	Height.			
23	2	6-9			
24	2	6-3			
25				1	
26	2½	6-4			
27	1½	5-11			
28				1	
29	1	6-5			
30				1	
31	3	10-5			
32				1	

Transport to Lahore.

142. The experiment of transport to Lahore is thus described :—

"From January to March 1877, 421 acres, 4 years old, in the Manjoki circle, was thinned, for the second time, to an average distance of 5 feet apart. The wood obtained varied from 3″ to 11″ in girth, but the great bulk was 3 to 6 inches; it was stacked on the spot in stacks of various dimensions, and was estimated to be about 9488 maunds. Subsequently, 107 acres were thinned, and yielded according to an estimate, 2412 maunds, making a total of 11,900 maunds for the whole area, or 22·54 maunds per acre; there then remained, roughly speaking, about 25,000 maunds of twigs.

"In December, carting was commenced, and all the wood was delivered on the Railway line by the 20th January 1878.

"In January, 3 trains, each comprising 30 trucks, were chartered, and the wood loaded up and brought to Lahore, but unfortunately from having only 3 hours allowed to load each train, and the men employed to load being new to the work, the average out-turn of each truck did not exceed 80 maunds, while the quantity charged for by the Railway was 137 maunds. The wood was carted to depots, one near Muhammad Sultán's Serai, and the other in the Lundá Bazaar, and when stacked was ascertained to be 7325 maunds or 50,268 cubic feet, allowing a standard of 6·86 cubic feet per maund. The sale of this wood by auction was advertised, but the highest bid being only Rs. 19 per hundred maunds, it was not sold in this manner.

"Subsequently it was bought up as here shown:

From 27th January to 29th March, 1605 maunds at an average Rs. 30 per % maunds.

From 30th March to 1st June 1878, 5725 maunds at Rs. 25 per % maunds.

The remaining 4100 maunds stacked along the Railway line at Changa Manga was put up to auction at a reserved price of Rs. 10 per 100 maunds, but as no fair offer was made, it was brought to depot. This time, however, instead of chartering a whole train, I arranged for five trucks at a time, and an average of 141 maunds was loaded in each truck; this is very satisfactory, and the wood is now selling at about 100 maunds per diem at Rs. 25 per % maunds.

Besides the above wood, there were 1,24,994 cubic feet, or 22,700 maunds of last spring's thinnings stacked, nearly green, which sold on the spot for Rs. 15 per 100 maunds.

This wood contained scarcely any brushwood, and averaged from 6 to 16″ in girth,

Some 7,037 bundles of twig wood were made, containing about 2 seers each, and I intended to bring them to depot also, but in the meantime I had brought in a quantity of the same kind of wood from the Shaderah plantation, which only gave a profit of Rs. 3-2-0 per 100 maunds, so that it would be impossible to make any profit on such wood brought from Changá Manga at the existing Railway rates,—in fact, there would be a loss of about Rs. 9-8-0 per 100 maunds.

In future, by careful supervision, and by better experience in such matters, the cost of carriage may be further reduced."

Rates paid and profit.

143. The following are the rates paid per 140 maunds (per wagon load).

Cutting into billets and stacking in the plantation						0	10	0
Cartage from plantation to station, at an average of 0-9-6 per 100 maunds per mile (5 miles)						4	3	0
Loading per truck						0	12	0
Railway hire first time	15	5	3	Average		12	4	4
Ditto 2nd time	9	3	6					
Unloading per truck						0	3	0
Cartage from station to Depot at an average per truck						2	12	0
Octroi duty						0	15	9
Stacking in the Depôt...						0	5	6
Depôt rent and watching						1	15	11
Total Rs.						24	1	6
Price realized per 140 maunds						36	10	3
Profit, exclusive of cost of thinning, which was Rs. 7-14-0 per 140 maunds ...						12	13	0

SECTION IV.

FINANCIAL RESULTS.

144. The general revenue as per form 49, compared with the previous years, gives:

	1875-76.	1876-77.	1877-78.
Revenue	9,05,742	5,98,754	6,88,710
Expenditure A	3,18,498	2,70,330	2,58,949
Do. B	2,35,728	2,52,153	2,58,217
Total ..	5,54,226	5,22,483	5,17,166
Surplus ...	3,51,516	76,231	1,66,544

There is also a saleable stock on hand (not including timber in transit) valued at Rs. 62,167.

Continued reduction of A expenditure.

145. I am glad to report that the expenditure under A. shows a continued decrease, though the material supply was kept up; the expenditure under B. shows only such a small increase as necessarily results from additional officers, or promotions.

Prospect financially good.

146. The prospect is altogether hopeful, if only there could be a little less delay in settling such questions as the reservation of the rakhs &c. I have been resolutely holding back large cuttings which would be possible for Rawalpindi, Northern Reserve, and in some other places, because I am determined not to allow large cuttings till the *right of securing reproduction is beyond question*, and till in the case of timber forests the demarcation of the area and a preliminary plan of operations is accomplished.

To push forward a settlement of these important matters is to secure a prospective increase of revenue; and no more hopeful proposal could have been started than the formation of a demarcation staff.

Free grants to be remembered.

147 It will also be seen that these figures of revenue might be considerably increased, if we took into account the large items of free grants.

Payments of lease money (usually forgotten in comparisons).

148. It is also to be borne in mind that all our chief timber forests are either held on lease, the payment of which is inevitable whether timber is cut or not, or else has to share its revenue with persons who are entitled to do so, as in Kaghan and Hazára generally.

In Hazára, for instance, out of a total seignorage of Rs. 24,729, Rs. 12,088 had to be paid over to zamíndárs.

Success of the new plan of local conversion in Dungagalli range.

149. The only local depôt where timber is sawn up and sold at present is in the Dungagalli range. The old system of giving out permits to fell trees, I have found not so easy to abolish as I at first thought, but good progress has been made with the depôt, and when once the working plans of the range are ready, it will, I hope, be possible entirely to exclude permit felling from the reserves. This year for depôt purposes, 494 trees were (before enumerated) felled, and yielded a revenue of Rs. 15,029 together with a balance in hand of some 7,000 pieces and 55,000 shingles. The cost of production was Rs. 9,522, yielding a cash profit of Rs. 5,507 besides the stock in hand.

The estimated cost price of material is about three annas per cubic foot, and the selling price nearly 6 annas.

Shingles realize Rs. 4 per mille, and cost about Rs. 2-14-0.

Timber sales at river depôts.

150. *Jhelum.*—The average price realized was Rs. 0-10-4 per cubic foot, which includes a small proportion of fines. 3,103 logs=91,560 cubic feet realized Rs. 59,279.

151. *Chenab.*—9,426 cubic feet were sold at special rates of 10 and 12 annas a foot to the State Railway, and 52,887 cubic feet at a special contract rate of 7 annas, taking all round 1st and 2nd class of short lengths.

2nd class deodar logs realized from 4 annas 6 pies to 8 annas a foot, and pines, from 3 annas to 4 annas 6 pies.

The sales were considerably less than in 1876, and there is consequently a considerable balance of timber in depôt.

152. *Ravi.*—The sales amounted to Rs. 86,805 realized, but there is a further sale completed, though the price Rs. 4,395, is outstanding, owing to a dispute that has since been settled.

A quantity of the timber was old and inferior that had been for some time in the depôt.

153. *Beas.*—The average rates obtained by sales are :—

	Rs.	A.	P.
1st class deodar per foot	0	13	2
2nd " " "	0	6	6
Chil	0	2	7
Deodar sleepers	0	13	4

154. *Sutlej.*—241,622 cubic feet of timber (of which only about 500 were pines) were sold for Rs. 127,174.

The considerable sales to the Indus Valley Railway (758,000) were credited this year, instead of last, which upset our estimates rather. The average rate is a little over 8 annas per foot.

Unusual sale of dead and fallen stuff to clear out Kalesar.

155. An immense sale of *debris* and dead wood from Kalesar (totally unexpected) amounted to over Rs. 13,000. The forest has been almost entirely cleared of dead stuff.

156. The general results of expenditure and receipts on timber, may be shown as follows:—

Division.	Expended.		Received.		
	1876-77	1877-78	1876-77	1877-78	
	A. P.	A. P.	A. P.	A. P.	
Sutlej	5-3	2-0	D. = 7-10 P. = 4-7	D. = 8-0 P. = 5-0	in log.
Beas	8-4	13-0	D. = 14-0 P. = 8-11	D. = 11-0 P. = 2-0	Nearly all scantling.
Ravi	4-4	3-0	D. = 12-3 P. = 4-8	D. = 7-0 P. = 3-0	
Chenab	1-9	6-0	D. = 7-6 P. = 3-1	D. = 8-0 P. = 3-0	
Jhelum	9-	3-0	D. = 5-6 P. = 3-1	D = 11-0 P. = 4-0	

No such table can be correct for *any one year*, but an average of many years will be correct. Advances made for sawing; all manner of expenditure in fact in one year, that has no possible relation to the timber received in the year, is the standard which gives the cost, but of course, this corrects itself when the result of several years is taken.

Revenue of other divisions and heads. Sales of fuel.

157. The bulk of fuel sold is practically removed by purchasers: they cut it under supervision, and stack it and pay according to the measured stacks. Scraps and small pieces collected on rivers, and the little fuel that is actually brought to a depôt, make up the Rs. 12,484 shown under I. The bulk appears under II A yielding Rs. 57,997.

Grazing income.

158. The grazing revenue is Rs. 1,72,179 against Rs. 1,80,933 last year.

The principal divisions had :—

	1876	1877
Fuel Reserve North	55,483	49,031
Fuel Reserve Central	106,610	102,507

The main reason of the difference in the Fuel Reserve division central, is the scarcity of grass in the Chúnian tahsil forests of Lahore, which are always managed direct, and which having so little grass brought in less fees. In the Northern division there was a larger area closed against grazing, and to the fact that the grazing of the Piragheb plantation belongs now to the Jhelum division.

Mr. Reuther thus compiled a statement which shows that the average return from 100 acres of grazing in this division, for the last 6 years, is Rs. 6-8-9.

Revenue of the plantation division.

159. The receipts and expenditure of our plantation division since 1873-4, have been :—

	Receipts.	Expenditure
1873-4	13,438	79,519
1874-5	14,618	63,447
1875-6	25,914	60,954
1876-7	15,496	53,668
1877-8	11,746	75,755

During this year the grass has produced much the same ; there being of course, a much larger yield of grass for the earlier years of a plantation, and a good deal from temporary cultivation. The comparative smallness of the income is due to the fact, that on the 31st March, a good deal of the thinnings remained unsold. Now we never have any difficulty in selling good sized thinnings, and on 31st March there were 2,01,707 cubic feet in hand. Considerably more than half of this had been sold at the rate of Rs. 2—12 per 100 cubic feet, since the close of the year.

Plantation grazing income.

160. Grazing gives average:

	1875-6 per acre Ans.	1876-7 per acre Ans.	1877-8 per acre Ans.
Changa Manga	1·25	1·01	0·96
Other Plantations	9·98	11·46	10·06

General results of planting work, financially.

161.—The 46th table gives the general results of planting.

I take 13,383 acres as the actually *stocked* area at the beginning of the year (the table shows a larger plantation area by including other places that *will* be stocked, but for comparision of expenditure I take the actual stocked area) The year's work is represented by operations on 1,610 acres.

The cost of maintenance, and the cost of the extension respectively are—(1) Rs. 16,647 and Rs. 34,710 exclusive of permanent establishment, or about Rs. 1-4 per acre for maintenance and Rs. 21-12 for formation. This latter, it must be remarked, includes the making of a length of embankment in some localities, for an area far in excess of what has been planted.

Local rates of work.

162.—Pursuing my plan of obtaining tables of rates (which in a few years will give valuable materials for an average,) I submit the following:—

(1.) This figure is obtained by deducting the contributions to Delhi and Peshawar, and establishment costs from the plantation expenditure.

Plantation Division.

Work.	Rates.			Per number or quantity.	Remarks.
	Rs. A. P.		Rs. A. P.		
Trenching	1 8 0	to	3 0 0	Per 1,000 cubic feet.	
Sowing seed	0 4 0	to	1 0 0	Per acre.	
Transplanting	3 0 0	to	7 0 0	Ditto.	
Thinning	1 2 0	to	1 10 0	Ditto.	
Stacking fuel	0 8 0	to	0 0 0	Per 1,000 cubic feet.	
Collecting seed	0 5 0	to*	1 0 0	Per maund.	
Carriage of fuel	0 8 0		...	Per 100 maunds per mile.	

Fuel Reserve Central.

		Rs. A. P.		
Lahore and Gujránwála	Felling fuel...	1 12 0	Per 100 maunds ...	By private contractors.
	Carriage „ ...	0 9 0	Per 100 maunds per mile ...	
Mooltan.	Felling fuel ...	6 8 0	Per 100 cubic feet ...	By Government.
	Carriage ...	1 9 0	Dtito per mile ...	
	Stacking ...	1 6 0	Per 100 cubic feet... ...	Works by cubic feet 100 cubic feet=350—500 maunds.
Muzaffargarh	Felling ...	8 0 0	Ditto ...	
	Carriage ...	1 13 0	Per 1,000 cubic feet per mile.	
	Stacking ...	1 6 0	Per 100 cubic feet.	

Fuel Reserve North.

Work.	Rates.	Per number or quantity.	Remarks.
	Rs. A. P.		
Earthwork	1 10 8	Per 1000 cubic feet (includes both digging out and forming the material in a bank).	
Cutting fuel	3 2 0 or about Rs. 10 ...	Per 100 maunds	Very high rate.
Carriage fuel	1 0 0	Per 100 cubic feet ... ... Per stage per cart would give about 4-0-0 per 100 maunds, or from 8 to 9 acres and 100 maunds per mile.	
Collecting seed	1 0 0 for kikar to 3-4-0 (sissú) and 4-4-0 for small seed of Dadonœa.		

Rawalpindi.

	Rs. A. P.		
Felling Chil trees ...	0 4 0	Each time.	
Conversion, *i. e.* logging and sawing up.	18 to 20	Per 100 pieces sawn of any scantling up to 15 feet in length.	Beyond 15 feet, thus are special rates.
Carriage by coolies ...	0 8 0	Each scantling up to 15 feet for the distance (30 miles) from the forests to station.	
Cutting and stacking green fuel	1 0 0	Per ⅞ cubic feet.	
Carriage of fuel &c. ...	1 0 0	Per ⅞ maunds per mile.	(About).

Chenab.

Felling &c., all processes to launch.	9·5—18′ length and 4 feet and up girth. 19′ and over 4 feet and above girth. } 12	Per log 6 annas	The work is counted by logs, the trees are felled, the logs made, marked, numbered, and launched by the number of logs.
Catching at Reási ...	0 12 0	Per 100 cubic feet.	
and at Baijwát ...	1 0 0	Ditto.	
Rafting, from Reasi to Akhnur	1 4 0	Ditto.	
Do. Reasi to sale Depôt	2 12 0	Ditto.	
Do. Island to Mooltan	5 8 0	Ditto.	
Landing at sale Depôt (hauling up, &c.)	4 0 0	Per 100 logs.	
Classifying and putting in lines	10 12 0	Ditto.	

Upper Ravi.

Felling trees ...	0 4 0	Each.	
Logging ...	0 4 0	Each log.	
Launching from ...	0 12 0 to 1 4 0	Per log. ...	According to girth.
Pay of sawyers at Sirsa, Barmuor &c., per day.	0 4 0	Each.	
If sawing done by contract then rates paid or	20 0 0	Per 1,000 superficial feet for Deodar, Kail, &c.,	
Coolies ..	0 3 0	Average per diem.	

Ravi.

	Rs. A. P.		
Catching, hauling up, arranging in lines, Shahpur depôt	0 2 0	Per cubic foot ...	There is no separate rate for classifying and arranging at sale depôts, the above rates include every thing.
Do. do. Behri ...	0 1 3	Ditto	
Do. do. Akhrota ...	0 1 2	Ditto	
Do. do. Trimmu ...	0 1 3	Ditto	
Rafting to sale depôt.			
Shahpur to Shahdara ...	0 1 6	Ditto	
Behri to do. ...	0 1 3	Ditto	
Akhrota, Timmu } to do. ...	0 1 3	Ditto	
Numbering ...	0 9 0	Per 100 logs ...	For all the depôts.
Felling trees in Kolatope ...	0 4 0	Each tree	
Converting them into scantlings, viz.,			
Deodar ...	20 0 0	Per 1,000 cubic feet ...	*Coolies* last year were paid anas 3 each; this year only able bodied men get anas 3, boys, 2 anas 6 pies.
Tos ...	22 0 0	Do. do.	
Oak ...	25 0 0	Do. do.	

BEAS.

KULU RANGE.

Works.	Rates.							Per number or quantity.	Remarks.
	Rs.	A.	P.		Rs.	A.	P.		
Felling logging and launching	0	1	0	to	0	6	0	Per running foot ...	These are the contract rates hitherto given according to the distance of the forest from the floating stream, the length of the logs, and the difficulties of the ground; but when timber operations are resumed, I mean to reduce these rates.
Coolies employed on all kind of work except sawing, carpentry or building.	0	2	0	to	0	3	0	Per diem	
Sawyers, carpenters and masons	0	3	0	to	0	4	0	Ditto	

HOSHIARPUR RANGE.

Cutting bamboos and bringing them to depôt.	0	4	0	to	1	0	0	Per 100 bamboos ...	1 % for the large, 0-12-0 per % for the medium, 0-6-0 per % for the small, and 0-4-0 per % for the walking sticks.
Carpenters ...	0	3	0	to	0	5	0	Per diem	
Masons ..	0	4	0	to	0	5	0	Ditto	
Coolies ...	0	2	0					Ditto	

NURPUR RANGE.

Cutting stones for building ...	5	0	0					Per 1,000 stones	
Cutting bamboos and bringing to depôt	0	4	0	to	1	0	0	Per 100 bamboos ...	As in Hoshiárpur.
Sawyers ...	0	4	0					Per diem	
Carpenters ...	0	4	0	to	0	7	0	Ditto	
Coolies ...	0	2	0	to	0	3	0	Ditto	
Masons ...	0	4	0	to	0	5	0	Ditto ...	0-4-0 for kucha and 0-5-0 for pucka work.
Sawing planks ...	12	0	0					Per 100 planks ...	Boards 12′ × 1″ × 1″.
Brick making ...	1	0	0					Per 1,000 kucha bricks ...	Bricks 12″ × 6″ × 4″ made and stacked.

DERA RANGE.

Carpenters ...	0	5	0					Per diem	
Masons ...	0	4	0					Ditto	
Blacksmith ...	0	4	0					Ditto	
Coolies ...	0	2	0					Ditto	
Felling, and sawing chil trees into kurrees	4	0	0					Per score	

KULLU RANGE.

	Rs.	A.	P.						
Sawing at Dada ...	0	4	3					Per piece ...	Scantlings 8′—13′ and 10″ × 5″ —10′ × 12″ × 8″
	0	7	3						These rates are a *very* little higher.
Catching and rafting from Nátaun.	60	0	0					Per 100 logs ...	To Wazír Bhulfar.
——— ———Dúndá ...	50	0	0					Per 100 logs	
——— ———Dádá ...	4	8	0					Per 100 pieces ...	For scantlings.
——— ———Hora ...	2	11	0					Do. ...	Do.
——— ———Murthal ...	27	0	0					Per 100 logs ...	For chil or deodar.
——— ———Naushahra...	24	12	0						Do.
Landing &c. logs at sale depôt	2	0	0						

SUTLEJ (Forest).

	Rs.	A.	P.		Rs.	A.	P		
Felling	0	4	0					Per tree	
Trimming knots and branches	0	2	0					Per tree	
Logging	0	4	0					Per log	
Launching	1	4	0	to	2	4	0	Per log ...	According to size.
Coolies	0	4	0					Per diem	
Carpenters	0	5	0					Do.	
Blacksmiths	0	6	0					Do.	

SUTLEJ (River).

Works.	Rates.			Per number or quantity.	Remarks.
Catching logs	0 2 6			Per log	
Cutting loops	3 8 0			Per 100 logs ...	For attaching of ropes in rafting.
Rafting to Phillour ...	16 0 0	to	25 0 0	Do.	
Landing at sale depôt ...	6 0 0			Do.	
Carting to actual depôt land	1 4 0	to	1 14 0	Per 100 cubic feet ...	From 1 1¼ miles.
Classifying and arranging in depôt.	6 4 0			Per 100 logs	

(KALESAR).

	Rs. A. P.		Rs. A. P.		
Cutting poles	0 10 0	to	1 9 0	Per score	According to size, the tárn, toor, balli and pole, are the 4 sizes.
Carting to depôt ...	0 12 0	to	3 0 0	Per score.	
Rafting to Abdullapur ...	0 8 0	to	1 13 0		
Cutting grass in bundles ...	2 0 0			Per 1000 bundles.	
Carting to depôt ...	2 0 0			Ditto.	

JHELUM.

As far as can be gathered from looking through the Cash Book, the following are the rates paid. No mention is made of "catching," so it is presumed "rafting" applies to that also.

Work.	Rates.			Per number or quantity.	Remarks.
	Rs.	As.	P.		
Rafting from Sâligram to Bagham. ...	2	8	0	Per ⅞ cubic feet ...	Very little or no timber appears to have been brought from Bagham to Jhelum, and the little that was brought from Islands was paid for by the log, 0-4-0 per log.
Rafting from Dungully to Bagham ...	1	12	0	Do.	
Rafting from Bull to Bagham	1	8	0	Do.	
Landing at Bagham ...	1	8	0	Do.	
Rafting from Islands to Jhelum Depôt ...	3	0	0	Do.	

MEMO.

Felling	0 8 0			Per tree	
Logging	0 5 0			Per log	
Marking	3 8 0			Per ⅞ logs (hundred)	
Launching	2 0 0	to	3 0 0	Per log ...	According to the distance from the river.
Coolies	0 4 0			Per diem	
Mate Do.	0 8 0			Do.	
Sawing into planks ...	18 0 0			Per ⅞ planks ...	Kurries, or beams, hard or soft timber.

GENERAL.

163. I have no special remarks on the establishment. Divisional officers have worked well, and their reports have been good. Though I do not lay stress on mere reporting, still a man cannot write a good report without having a good knowledge of his division, and it is proper to remark, that the very best report of the year, accurate, and intelligibly written, has been prepared by Mr. A. N. Reuther, a young officer who only joined in July 1877, and whose diligence in learning the work of his division is most praiseworthy.

Supply of stationery.

164. A great deal of trouble has been experienced with stationery. Not only has the most vexatious delay taken place in complying with indents, leaving whole divisions without supplies, but the material has been arbitrarily cut down, and insufficient, and of most inconvenient quality. I believe that if allowed, I could provide the whole department with cheap and convenient stationery, certainly at a much less cost than is done at present, and certainly without the endless trouble and annoyance the present system invariably causes.

Seed fall.

165. As regards seeding in the plains, phulâhi and jhand seed have been scarce and bad.

On the Ravi the conifers seeded well, oaks less so than usual.

On the Beas, deodar seed was plentiful and good, so was chool; large quantities of the latter were during the season of scarcity consumed as food in Kángra.

Neither Chenab, Sutlej, nor Jhelum, mention the state of the seed, which is to be regretted.

166. The usual flood registers, which if regularly kept up, will one day be valuable, are appended.

FORMS.

The usual forms are appended.

Form 45 has an explanatory sheet attached, which will, I hope, obviate any doubts as to the opening figures.

Form 47 cannot be applied to the Punjab; we can only show the fires that took place. In other forests it is only needed to sweep away dry pine needles near public roads.

Form 59 has been discontinued by order.

B. H. BADEN-POWELL,

Conservator of Forests, Punjab.

Forest Department Punjab.

Lower Jhelum Sub-Division.

List of floods for years 1877-78.

No.	Month and Date.		Height.	Duration.	Remarks.
1	April ...	13th & 14th	3 feet ...	24 hours	
2	November ..	18th	3 „ ...	10 „	Local floods.
3	„ ...	20th	3 „ ...	24 „	Ditto
4	„ ...	24th, 25th & 26th	4¼ „ ...	4 days	On the 25th the flood came down with greater force, and the river rose nearly 5 feet. A few logs were brought down and stranded on the islands. The traders lost a large quantity of timber and sleepers &c., and the bridge of boats carried away. Bela Piraghaib under water.
...	...	...	...	...	
...	...	...	...	...	
...	...	...	...	...	
5	December ...	10th	3½ „ ...	4 hours	Local floods.
6	„ ...	28th	6 „ ...	28 „	No damage was done to Government timber, but the traders lost a few logs.
7	February ...	9th & 10th	3 „ ...	2 days	Local floods.
8	„ ...	26th	6½ „ ...	32 hours	

E. FOREST,

Assistant Conservator,

Jhelum Sub-Division.

Forest Department, Punjab.

Lower Chenab Sub-Division.

Register of floods for 1877-78.

Month and Date.		Part of the river affected.	Duration.	Remarks.
				feet
July 1877 ...	30th	Whole river ...	7 hours	14′ 6 at 6 A. M. no loss
August „ ...	17th	Do. ...	...	11′ 5 at 12 A. M. no loss
December „ ...	28th	Do. ...	1 hour	12′ at 12 A. M.
February „ ...	27th	Do. ...	2 hours	13 at 12 A. M.

ROBERT ELLIS,

Assistant Conservator,

Chenab Division.

Flood Register of Sidhouri Gauge—River Ravi.

	June 1877	July 1877	August 1877		September 1877	
1	10·3	12·0	11·5		10·4	
2	10·6	11·6	10·9		10·5	10·9
3	10·8	11·3	10·8		10·9	
4	10·6	10·5	10·8		13·5	15·5
5	10·8	10·3	11·0		10·7	
6	11·0	10·3	11·1		10·0	
7	10·9	10·2	11·1		9·9	
8	11·0	10·2	11·2		9·8	
9	10·6	10·3	11·1		9·5	
10	10·6	10·4	11·0		9·4	
11	10·6	10·5	10·7		9·4	
12	10·3	10·6	10·8		9·4	
13	10·0	10·7	11·4		9·3	
14	10·0	10·7	11·4		9·2	
15	10·3	10·9	11·2		9·1	
16	10·3	10·7	10·9		9·1	
17	10·3	11·0	12·5		9·1	
18	10·1	11·3	10·9		9·0	
19	9·9	11·0	11·5		8·9	
20	9·9	10·9	11·3		8·9	
21	10·0	11·0	10·9		8·9	
22	10·1	10·9	10·5		8·9	
23	10·2	10·7	10·4		8·9	
24	10·5	10·7	10·4		8·9	
25	10·8	10·7	10·5		8·9	
26	10·9	10·9	10·6		8·9	
27	11·2	11·1	10·6		8·9	
28	11·7	11·1	10·6		11·0 9·0	
29	12·8	11·3	12·0 10·5		9·0	
30	13·1	12·5	12·8 10·4		8·9	
31	...	11·8	12·2 10·3		...	

The black letter figures denote the maximum readings of a passing flood.
The black one Readings at 6 A. M. Minimum reading of year was 8·3 on 3, 4, 5, 6, 9, 10, 11, 12, 13 × 19th November 1877.
Maxima readings throughout year were:—

14th April	12·4	th8 October	9·8	27th January 7812·4	
28th April	10·2	26th November	11·0	21th February	12·2
5th May	10·9	9th December	10·1	27th February	1·32
12th May	11·5	10th December	12·2	28th March	10·7
		29th December	12·7		

JAMES BLOCHMANN,

ASSISTANT ENGINEER

1st Division B. D. Canal.

FLOOD GUAGE KEPT AT THE RAILWAY BRIDGE BEAS DURING 1877-78

Rail Level 157·50 *above sea level.*

APPENDIX D.

Date.	Month. June 1877. Ft.	Dcl.	Month. July 1877. Ft.	Dcl.	Month. August 1877. Ft.	Dcl.	Month. September 1877. Ft.	Dcl.	Remarks.
1st	129	92	132	92	135	00	130	50	
2nd	129	92	132	09	133	40	130	40	
3rd	130	00	133	00	132	60	131	60	
4th	134	34	132	50	132	20	137*	20	The highest flood.
5th	130	64	132	42	131	90	133	40	
6th	130	67	131	25	131	80	132	30	
7th	130	67	130	67	131	90	131	90	
8th	131	34	130	50	131	90	131	60	
9th	131	25	130	34	131	90	131	60	
10th	130	92	130	42	131	80	131	10	
11th	130	42	130	00	131	70	130	90	
12th	130	25	131	40	131	50	130	70	
13th	130	17	130	75	131	10	131	20	
14th	130	07	130	84	131	40	131	10	
15th	129	84	131	00	131	90	130	60	
16th	129	50	131	84	131	70	130	40	
17th	129	75	132	42	131	50	130	30	
18th	129	84	132	09	131	30	130	30	
19th	129	92	132	67	131	20	130	10	
20th	130	00	131	84	131	20	130	00	
21st	129	84	131	42	133	00	129	90	
22nd	129	75	131	09	132	10	129	80	
23rd	129	67	131	25	131	30	129	80	
24th	129	50	131	17	130	70	129	70	
25th	129	67	131	09	130	40	129	70	
26th	130	45	130	92	130	30	129	60	
27th	130	50	131	00	130	40	129	50	
28th	131	75	131	34	130	50	129	50	
29th	131	09	131	42	131	30	129	40	
30th	132	67	131	75	132	40	129	40	
31st	...	...	136	00	131	00	...	...	

MAIN LINE DIVISION SIRHIND CANAL

Register of floods during the year 1877-78.

Date.		Floods.	Remarks.
June 1877 ...	7th	8·15	At 3. P. M.
" " ...	29th	11·80	At 8. A. M.
July 1877 ...	15th	10·40	At 5. A. M.
" " ...	17th	9·50	At 12. A. M.
August 1877 ...	22nd	8·80	" "
September 1877 ...	3rd	13·30	During night.
November 1877 ...	26th	5·20	At 3. P. M.
" " ...	30th	5·40	At 12. A. M.
December 1877 ...	10th	8·05	" "
" " ...	29th	8·82	At 2. P. M:
January 1878 ...	27th	7·50	At 5. P. M.
February 1878 ...	11th	5·90	At 12. A. M.
" " ...	22nd	6·60	During night.
" " ...	27th	6·35	At 5. P. M.
April 1878 ...	13th	9·20	During night.
" " ...	14th	8·70	" "

C. E. FENDALL,

Assistant Conservator,

Sutlej Division.

Annual Form No. 45.—[*Prescribed*].

Forest Department, Punjab.

Area of Reserved Forests, 1877-78.

Division.	Name of Forest Range.	Area on 1st April 1877.		Added during the year.		Excluded or transferred to other heads.		Total on 31st March 1878.		No. and date of notification of additions and transfers &c.	Remarks.
		Square miles.	Acres.	Square miles.	Acres.	Square miles.	Acres.	Square miles.	Acres.		
JHELUM.	Dungágullí	63	40,383	...	..	...	...	63	40,383		The acreage is not quite certain till it is definitely settled what is the area of Nathyágulli, Dungágulli and Thandíani to be deducted.
	Kághán	90	57,487	...	...	...	...	90	57,487		
	Siran...	33	20,986	...	...	...	...	33	20,986		
	Khánpur	50	31,786	...	...	...	...	50	31,786		
	Total ...	236	1,50,642	...	...	...	...	236	1,50,642		
RAWAL-PINDI.	Murree	156	1,00,196	...	...	...	...	156	1,00,196		About to come under settlement.
	Kahúta ...	217	1,38,913	...	...	...	...	217	1,38,913		
	Rawalpindi	51	32,732	...	...	...	...	51	32,732		
	Fatahjang ...	74	46,660	2	1,171	...	...	76	47,831		The Kanleal rakh has been given over to us.
	Attock ...	61	39,038	...	...	...	...	61	39,038		
	Gújar Khan ...	12	7,983	...	...	...	...	12	7,983		
	Total ...	571	3,65,522	2	1,171	...	...	573	3,66,693		
FUEL RESERVE NORTH.	Jhelum Plains ...	205	1,31,380	...	...	...	...	205	1,31,380		By giving up Bela Charágah to grazing ground. By correction of an error of 60 acres (misprint of 6 for 0) and by exclusion of certain small rakhs Siyál, Daffar, and Jatta, made over to zamindars, the whole area will soon be revised. The total Jhelum islands (after transfer for plantation purposes of Perághaib &c.) was overstated. Addition of 254 by alluvion loss, 444 by deluvion, and remainder by correction of former errors.
	Gujrát ...	34	21,976	...	...	...	...	34	21,976		
	Shahpur ...	235	1,50,677	...	...	5	2,900	230	1,47,777		
	Salt Range ...	498	3,18,766	...	...	2	1,651	496	3,17,115		
	Pabbi Range ...	39	25,237	...	...	...	...	39	25,237		
	Islands Jhelum ...	2	904	...	...	1	479	...	425		
	Islands Chenab ...	9	5,970	...	254	1	822	8	5,402		
	Total ...	1,022	6,54,910	...	254	9	5,852	1,013	6,49,312		
CHENAB.	Darwas ...	3	2,181	...	...	..	...	3	2,181		
	Kilár ...	7	4,288	...	...	...	...	7	4,288		
	Sánch ...	8	4,829	...	...	...	...	8	4,829		
	Púrti ...	14	8,931	...	...	...	...	14	8,931		
	Tindí ...	29	18,884	...	...	...	...	29	18,884		
	Total ...	61	39,113	...	...	...	...	61	39,113		
RAVI.	Kálátop ...	4	2,870	...	...	...	...	4	2,870		The Ravi officer has given a revised estimate of reserves much in excess of this, but as demarcation is in progress it is useless to alter it at present.
	Kaintli ...	1	645	...	...	...	...	1	645		
	Baklo ...	2	1,280	...	...	...	...	2	1,280		
	Banni Khet ...	1	537	...	...	...	...	1	537		
	Basins of Ravi Siul and tributaries.	150	96,000	...	...	...	...	150	96,000		
	Total ...	158	1,01,332	...	...	...	...	158	1,01,332		
BEAS.	Kúlú, Seoráj & Rupi,	21	13,583	...	...	...	...	21	13,583		41 acres found to be within the Guler jágír and restored 22 by correction of error pointed out by divisional officer. Addition to correct former table according to Settlement Record.
	Núrpur ...	15	9,703	...	...	...	...	15	9,703		
	Dera ...	18	11,108	...	...	...	66	18	11,042		
	Hamirpur ...	6	3,708	...	...	...	...	6	3,708		
	Hoshiárpur ...	8	4,847	15	10,389	...	...	23	15,236		
	Total ...	68	42,949	15	10,389	...	66	83	53,272		
SUTLEJ.	Bashahar ...	38	24,600	...	...	...	...	38	24,600		
	Kalesar ...	50	32,000	...	...	...	...	50	32,000		
	Total ...	88	56,600	...	...	...	...	88	56,600		
FUEL RESERVE CENTRAL.	Amrítsar ...	4	2,793	...	...	...	...	4	2,793		The areas still nominally in charge, but proposals for each district entirely modifying the figures are before the authorities.
	Lahore ...	331	2,11,724	...	...	...	...	331	2,11,724		
	Gujránwála & Jhang,	379	2,42,693	...	...	...	...	379	2,42,693		
	Montgomery ...	865	5,53,264	...	...	...	...	865	5,53,264		
	Mooltan ...		under settlement.								
	Muzaffargarh ..		Do.								
	Dera Ghazi Khan ...		Do.								
	Total ...	1,579	10,10,474	...	...	...	...	1,579	10,10,474		
	Grand Total ...	3,783	24,21,542	17	11,814	9	5,918	3,791	24,27,438		

EXPLANATION TO STATEMENT 45.—(RESERVES.)

The closing figures of last annual report were questioned by the Government of India, and in a letter of this office forwarded to Government of India in Punjab Government No. 374 C. dated 26th July 1878, it was explained that the closing figures should be corrected as shown in the following table. Minute differences due to omissions of decimals.

		Closing balance 1876.		
JHELUM—	Dungagullee	63	236	As it should be
	Kaghan	90		The same.
	Siran	33		
	Khanpur	50		
RAWALPINDI—	Murree	157	571	The same.
	Kahúta	217		
	Rawalpindi	51		
	Fatehjang	73		
	Attock	61		
	Gujar Khan	12		
F. R. N.—	Jhelum (*plains*)...	205	1,022	The same.
	Gujrat do.	34		
	Shahpur do.	235		
	Salt Range	498		
	Pabbi Range	39		
	Islands	11		
CHENAB—	Darwas	3	61	The same.
	Kilar	7		
	Sánch	8		
	Purti	14		
	Tindi	29		
RAVI—	Kalatop	4	158	The same.
	Kaintli	1		
	Baklo	2		
	Baniket	1		
	Ravi and tributaries	150		
BEAS—	Kulu &c.	21	66	Should be 68 by error in calculating; Dera should be 18.
	Núrpur	15		
	Dera	16		
	Hamirpur	6		
	Hoshiárpur	8		
SUTLEJ—	Basahir	38	88	The same.
	Kalesar	50		
FUEL RESERVE CENTRAL—	Amritsar	4	1,579	The same.
	Lahore	331		
	Gujranwála	379		
	Montgomery	865		
	Mooltan	...		
	Muzaffargarh	...		
	Dera Ghází Khan	...		

No. 45.

AREA OF UNRESERVED FORESTS (SUCH AS IN ANY WAY UNDER FOREST DEPARTMENT ORDERS).

Forest Division.	Civil District.	*Area 1st April 1877.* Square miles.	*Added.* Square miles.	*Excluded.* Square miles.	*Total 31st March 1878.* Square miles.	REMARKS.
Jhelum	Hazára	1,130	...	...	1,130	Shewn, not because the smallest control is permitted in part of this department, but because it is hoped this area will soon become "village forest."
Rawalpindi	Rawalpindi	287	...	...	287	
Fuel Reserve North ...	Jhelum	64	...	...	64	
	Shahpur	905	...	...	905	
Fuel Reserve Central ...	Lahore					
	Amritsar					
	Montgomery... ...					
	Mooltan	...	...	...	...	All quite unknown; whatever is not reserved is in fact Government waste, not under any forest protection.
	Muzaffargarh ...					
	Dera Ghází Khan ...					
	Gujránwála & Jhang,					
Beás	Hoshiárpur	54 (in Amb.)	27	...	81	Then add 27 miles measured in Pasuáh pargana not known last year.
	Kángra	537	...	317	220	For 3 táhsils Hamírpur, Dehra and Núrpur, Kángra is not known.
	Kulú Sub-division ...	53	327	...	380	Additions made to correct 1st list and include also forest in Seoraj and Rupí,—all that is not "reserved."
	TOTAL ...	3,030	354	317	3,067	

Annual Form No. 46.—(*Prescribed*).

Forest Department, Punjab.

Area of plantations, 1877-78.

Division.	Name of Plantation.	On 1st April 1877. Area.	On 1st April 1877. Total Cost.	During 1877-78. Area added.	During 1877-78. Cost.	On 31st March 1878. Total Area.	On 31st March 1878. Total Cost.	Remarks.
		Acres.		Acres.		Acres.		
Jhelum	Seila island ...	182¼	...	...	...	182¼	...	Nothing in this as yet.
	Piraghaib island ...	424⅝	...	16⅞	...	441½	...	
	Changlagalli } Dungagali Range	44	2,574 0 0	...	...	44	2,574 ...	Permanent nurseries for introduction of deodar into forests generally of the Range.
	Kujagali } Dungagali Range	12				12		
	Kotli ...	10				10		The Kutli area was omitted by mistake last year.
	Khanpur Range ...	½	88 0 0	...	...	½	88 ...	A nursery for experiment only.
Rawal-Pindi.	Khairi Murat ...	...	...	65	914 0 0	65	914 0 0	Omitted from last year's table.
	Ghoragulli ...	½	41 0 0	...	29 0 0	½	70 0 0	Small forest garden at Forest house.
Fuel Reserve North.	Pabbi *reboisement* ...	150	2,247 0 0	1,300	1,065 0 0	1,450	3,312 0 0	Is a closed rakh in which small expenditure is incurred for sowings as occasion offers, hence included.
	Rakh Garat ...	10	185 0 0	50	105 0 0	60	290 0 0	
	Bela Pindi Tátár ...	...	...	27	594 0 0	27	594 0 0	Islands on Chenáb.
	Do. Nath ...	...	...	10		10		
Ravi.	Bassu ...	146	6,670 0 0	3	150 0 0	149	6,820 0 0	
	Dhawn ...	25	106 0 0	...	...	25	106 0 0	
	Barmour ...	...	...	...	...	Unknown	76 8 0	Small plot at forest house.
	Suira ...	...	...	...	...	Do.	195 12 11	I have let these stand they represent early experiment on this river, but are in no way entitled to be included in plantations, some (such as Jung Banni) have resulted in small groves.
	Jung Banni ...	...	...	...	...	Do.	364 3 6	
	Chanota ...	...	...	...	...	Do.	1,087 6 4	
	Barnota ...	...	...	...	...	Do.	305 14 11	
	Chitrari ...	...	...	...	...	Do.	13 11 0	
	Bara Banso ...	...	...	...	...	Do.	26 6 6	
	Pherna ...	...	...	...	...	Do.	496 8 8	
	Siwali & Drub near Ulána	...	...	...	...	Do.	29 11 0	
	Previous expenditure on plantation.	...	...	...	...	Do.	1,077 8 0	
	Locality not mentioned in Cash Book.	...	...	...	...			
Beas.	Naushahra island ...	397	Unknown.	...	...	397	...	Early experiment in plantation division, made over to Beas Division on completion
	Chitril Forest Garden ...	9	135 0 0	5	634 0 0	14	769 0 0	
	Manáli Do. ...	2	200 0 0	...	196 0 0	2	396 0 0	
	Lee Do. ..	...	...	4	283 0 0	4	283 0 0	
Sutlej.	Nachar ...	60	564 0 0	...	...	60	564 0 0	Nurseries.
	Rorang ...	2	128 0 0	6	117 0 0	8	245 0 0	
	Sholtu ..	6½	559 0 0	...	27 0 0	6½	586 0 0	
	Fuel reserve, an area, planted under cultivating lease is omitted, as it has been at no cost to the Department nor effected by its agency.							
	Total of Forest Divisions	1,481⅜	13,497 0 0	1,486⅞	4,114 0 0	2,868¼	21,284 10 10	
Plantation.	*A.—Changa Manga* ...	9,112	3,18,031 0 0	960	29,803 0 0	10,072	3,47,834 0 0	
	B.—Lahore Sailaba							
	Jugian, Shadera and Mahmúd Buti.	1,199	19,817 0 0	...	575 0 0	1,196	20,392 0 0	3 acres lost by erosion.
	Jhoke and Sadhanwali...	1,317	19,220 0 0	...	1,547 0 0	1,315	20,767 0 0	2 Ditto ditto.
	C.—Outlying plots.							
	Nag ...	412	28,691 0 0	...	251 0 0	412	28,942 0 0	
	Jullundur ...	51	3,488 0 0	...	75 0 0	51	3,563 0 0	
	Phillour ...	239	13,077 0 0	...	187 0 0	239	13,264 0 0	
	Ludhiána ...	190	6,393 0 0	...	266 0 0	190	6,659 0 0	
	Jagádhri ...	184	9,168 0 0	...	98 0 0	184	9,266 0 0	
	Tatta Faqir-ulla ...	393	3,281 0 0	...	69 0 0	393	3,350 0 0	
	Carob plot ...	37	2,206 0 0	...	133 0 0	37	2,339 0 0	
	D.—Rakh improvement.							
	Kikranwali ...	576	1,636 0 0	...	788 0 0	576	2,424 0 0	
	Experiments ...	...	821 0 0	...	29 0 0	...	850 0 0	
	Baoli Lehna Singh ...	100	5,350 0 0	485	15,953 0 0	585	21,303 0 0	
	Kot Lakhput ...	...	17 0 0	110	4,361 0 0	110	4,378 0 0	
	Chichra ...	...	... 0 0	55	4,442 0 0	55	4,442 0 0	
	Plantation Division ...	...	... 0 0	...	0 0	...	... 0 0	*Expenditure of the year *includes* a grant of Rs. 746 to the local plantation at Peshawar, and Rs. 1716 to Delhi.
	Expenditure ..	...	1,93,305 0 0	...	17,177 0 0	...	2,10,482 0 0	
	Total of plantation Division only.	13,810	6,24,501 0 0	1,610	75,754 0 0	15,415	7 00,255 0 0	
	Total of whole ...	15,291⅜	6,37,998 0 0	3,096⅞	79,868 0 0	18,283¼	7,21,539 10 10	

Annual Form No. 48—[*Prescribed.*]

Forest Department, Punjab.

Prosecutions for Breaches of Forest Rules, 1877-78.

Forest Division and Civil District.	*Injury to forests by fire.*		*Unauthorized felling or appropriation of wood and minor forest produce.*		*Grazing without permission or in tracts in which grazing is prohibited.*		*Other offences.*		Total.				Remarks.
									Prosecutions.		*Convictions.*		
	Cases.	Persons.	Cases.	Persons.	Cases.	Persons.	Cases.	Persons.	Cases.	Persons.	Cases.	Persons.	
Sutlej Division.													
Bashahir	...	...	2	3	...	...	...	...	2	3	2	3	
Do.	2	3	...	...	...	...	...	...	2	3	2	3	
Do.	...	...	...	...	...	...	1	10	1	10	1	10	
Hoshiárpur	...	...	6	10	...	...	...	...	6	10	5	7	
Beas Division.													
Hoshiarpur	...	...	7	11	...	...	...	...	7	11	5	8	
Kángra	7	33	84	175	47	93	8	22	146	323	126	234	
Gurdáspur	...	...	6	6	...	...	...	...	6	6	6	6	
Amritsar	...	...	1	1	...	...	...	...	1	1	...	...	
Ravi Division.													
In Chamba Upper Sub-Division.	...	...	5	11	2	3	4	5	11	19	10	17	
British jurisdiction, Lower Divn.	...	...	...	...	...	...	3	3	3	3	3	3	
Chenab Division.													
Gujrat	...	...	...	...	...	...	5	6	5	6	4	5	
Siálkot	...	...	...	...	...	...	5	6	5	6	5	5	
Shahpur	...	...	...	...	...	...	1	1	1	1	1	1	
Jhang	...	...	...	...	...	...	1	4	1	4	1	1	
Jhelum Division.													
Hazára	19	29	93	231	35	89	11	24	158	373	74	84	84 Cases pending.
Lower Jhelum Sub-Division.	...	...	22	26	2	3	1	3	25	32	25	30	
Rawalpindi Division.													
Murree Range	1	1	48	64	3	4	7	8	59	77	28	33	
Rawalpindi	...	...	83	173	10	12	2	3	95	188	69	137	
Kahuta	...	...	24	24	1	1	2	2	27	27	15	15	
Fatahjang	...	...	25	42	100	107	1	1	126	150	89	97	
Attock	...	...	14	29	4	10	...	...	18	39	6	13	
Total Rawalpindi District ...	1	1	194	332	118	134	12	14	325	481	207	295	
North Fuel Reserve Division.													
Jhelum	...	...	16	40	2	7	3	4	21	51	15	32	
Shahpur	...	...	14	22	1	1	1	3	16	26	12	18	
Gujrat	...	...	12	25	7	33	5	26	24	84	17	38	
Fuel Reserve C. Division.													
Amritsar	...	...	...	...	2	24	...	...	2	24	2	4	
Lahore	...	...	...	...	...	...	3	5	3	5	2	2	
Do.	...	...	...	...	4	4	1	1	5	5	4	4	
Gujránwála	...	...	...	...	1	2	1	2	2	4	2	4	
Montgomery	3	3	...	...	6	15	18	37	27	57	20	47	
Moultan	...	...	...	...	3	12	4	5	7	17	5	16	
Muzaffargarh	...	...	...	...	...	...	4	4	4	4	3	3	
Dera Ghází Khan ...	...	...	...	...	1	2	5	6	6	8	3	3	
Gurdáspur	...	...	...	...	...	...	1	1	1	1	1	1	
Plantation Division.													
Lahore	...	...	4	7	3	26	1	2	8	35	7	28	
Gujránwála	...	...	2	4	...	...	...	...	2	4	2	3	
Jullundur	...	...	1	1	...	...	...	...	1	1	1	1	
Total ...													

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Forest Department, Punjab.

Summary of Revenue of the different Divisions, 1877-78 :

Budget Heads, Receipts.	Direction.	Sutlej Division.	Beas Division.	Ravi Division.	Chenab Division.	Jhelum Division.	Rawalpindi Division.	Fuel Reserve Central Division.	Fuel Reserve Northern Division.	Plantation Division.	Total.
I.—Timber and other produce removed from the forests by Government Agency :—											
											3,69,322 14 8
a. Timber	...	1,30,694 7 1	31,996 13 ...	84,815 3 3	47,321 13 4	74,494 10 ...	...	...	...	...	12,483 9 2
b. Firewood and Charcoal ...	...	177 ...	... 4 ...	3,416 14 4	346 2 ...	557 ... 7	...	6,743 2 7	651 3 10	591 13 10	10,600 11 9
c. Bamboos	...	181 ...	10,418 9 9	...	1 2 ...	...	...	...	...	...	...
d. Sandal-wood	...	...	...	...	...	...	...	...	...	...	25 10 3
e. Grass and other Minor Produce	...	...	25 10 3	...	...	...	...	...	...	...	
II.—Timber and other produce removed from the forests by consumers or purchasers :—											
											33,934 14 3
a. Timber	...	13,633 3 ...	2,192 4 3	421	7 ...	16,874 8 ...	575 15 ...	268 ...	3 ...	...	57,996 11 11
b. Firewood and Charcoal ...	...	622 6 ...	140 2 4	505 8 ...	...	3,643 2 2	26,181 10 6	23,089 8 1	2,558 ... 10	1,256 6 ...	1,302 8 1
c. Bamboos	...	134 13 2	147 2 11	...	...	...	1,020 8 ...	...	...	...	1,72,178 11 8
d. Grazing and Fodder Grass ...	...	285 ... 9	3,371 15 9	...	...	7,616 13 11	3,693 1 1	1,02,507 4 ...	49,031 4 8	5,673 3 9	2,672 13 5
e. Other Minor Produce ...	...	105 ...	106 14 6	...	...	37 3 6	498 8 9	917 11 6	111 8 ...	895 15 2	
III.—Confiscated, drift and waif wood	...	...	687 12 5	20 ...	15 8 ...	198 3 ...	14 15 ...	...	...	915 6 6	1,851 12 11
IV.—Revenue from forests not managed by Government :—											
a. Duty on Foreign Timber and other Forest Produce	...	...	...	9 10 ...	...	...	...	...	...	...	9 10 ...
b.—Revenue from Shared and Private Forests	...	...	679 5 5	...	...	...	...	...	...	...	679 5 5
V.—Miscellaneous :—											
											1,851 9 8
a. Fines and Forfeitures ...	...	7 ...	320 5 9	17 8 ...	17 10 6	225 7 7	175 12 4	104 ... 5	975 13 1	8 ...	2,588 10 10
b. Refunds	...	190 ...	...	2,060 2 8	334 6 2	...	...	...	4 2 ...	...	16,170 11 5
c. Other Sources	7 15 ...	507 14 ...	211 6 ...	...	1,309 8 8	7,543 15 6	269 13 8	636 15 2	3,280 4 9	2,404 14 8	
Total Receipts ...	7 15 ...	1,46,537 12 ...	50,298 10 4	91,265 14 8	49,353 2 8	1,11,191 ... 3	32,428 4 4	1,34,266 9 9	56,615 5 2	11,745 1 11	6,83,710 5 8

Annual Form No. 49.—[*Prescribed.*]

Forest Department, Punjab.

Summary of expenditure of the different divisions, 1877-78.

Budget Heads. A—Conservancy and Works.	Direction	Sutlej Division.	Beas Division.	Ravi Division.	Chenab Division.	Jhelum Divi-ion.	Rawalpindi Division.	Fuel Reserve Central Division.	Fuel Reserve Northern Division.	Plantation Division.	Total.
I.—Timber and other produce removed from the forests by Government Agency :—											
a. Timber ...	...	4,314 12 2	5,082 6 0	22,754 11 8	8,563 1 6	73,712 4 3	...	...	...	...	1,14,427 3 7
b. Firewood and Charcoal ...	...	...	...	514 13 6	23 10 5	...	...	4,721 1 5	30 5 3	1,238 9 2	6,528 7 9
c. Bamboos ...	...	6 12 0	3,017 7 11	...	...	...	...	...	...	...	3,024 3 11
d. Sandal-wood ...	...	...	...	...	...	...	...	...	...	...	...
e. Grass and other Minor Produce	...	...	...	...	...	...	...	...	54 14 2	...	54 14 2
II.—Timber and other produce removed from the forests by consumers or purchasers ...	...	...	152 0 0	...	...	767 3 4	526 0 0	...	85 5 10	...	1,530 9 2
III.—Confiscated, drift and waif wood ...	...	29 9 3	8 0 0	...	2 4 0	...	...	...	...	...	39 13 3
IV.—Revenue from forests not managed by Government :—											
a. Duty on Foreign Timber and other Forests Produce ...	...	...	...	...	...	...	...	...	...	...	...
b. Revenue from Shared and Private Forests ...	...	...	...	...	...	...	...	...	...	...	...
V.—Rent of leased forests and payments to shareholders in forests managed by Government ...	...	1,000 0 0	3 8 1	...	21,000 0 0	11,695 15 0	...	...	...	...	33,699 7 1
VI.—Live and dead stock :—											
a. Purchase of Cattle ...	...	...	...	...	...	...	...	...	...	3,138 8 0	3,138 8 0
b. Feed and Keep of Cattle ...	...	3 6 6	...	...	...	...	...	...	...	481 5 1	484 11 7
c. Plant, Tools and Instruments ...	...	...	498 13 5	53 6 10	94 0 6	546 13 8	167 8 4	242 4 0	161 0 0	1,280 11 0	3,044 9 9
VII.—Communications and buildings :—											
a. Roads and Bridges ...	...	76 15 6	722 3 0	790 1 8	358 12 1	5,335 9 5	192 15 0	...	...	65 12 9	7,542 5 5
b. Buildings ...	...	1,110 15 1	935 1 8	556 6 2	175 10 5	6,122 11 9	399 14 3	11 8 0	3,215 15 2	1,243 14 3	13,772 0 9
c. Other Works ...	...	9 14 6	74 13 0	...	464 0 3	30 0 0	...	...	14 10 0	...	593 5 9
VIII.—Demarcation, improvement and extension of forests :—											
a. Demarcation ...	...	7 9 0	758 0 0	...	...	450 11 9	562 0 7	4,931 13 1	1,514 0 4	137 3 6	8,361 6 3
b. Compensation for Land and Rights ...	...	74 0 0	146 15 4	266 0 4	...	...	...	...	...	...	486 15 8
c. Surveys and Working-Plans ...	...	34 13 0	...	...	6 9 6	815 7 11	52 14 6	2,172 4 4	26 12 6	...	3,108 13 9
d. Plantations ...	...	144 3 7	1,410 15 10	...	...	5 0 0	...	...	1,764 7 11	44,311 0 8	47,635 12 0
e. Protection from Fire ...	...	...	36 12 0	9 0 0	...	100 0 0	...	...	...	13 0 0	158 12 0
f. Other Works ...	...	117 6 6	1,526 2 6	1,722 9 0	...	647 6 6	1,320 2 4	29 4 0	376 5 1	1,972 15 0	7,712 2 11
IX.—Miscellaneous :—											
a. Refunds ...	...	...	...	84 9 5	11 0 0	449 8 0	289 0 0	217 3 0	485 15 0	...	1,537 3 5
b. Law Charges ...	...	...	1 14 0	95 0 0	...	...	...	...	19 0 0	34 11 0	166 8 0
c. Other Charges ...	571 9 6	99 11 10	332 5 5	355 9 6	21 3 10	174 1 0	4 13 3	217 11 6	104 13 3	35 4 0	1,895 9 1
Total A.—Conservancy and Works ...	571 9 6	7,030 0 11	14,707 6 2	27,202 4 1	30,720 4 6	1,00,852 12 7	3,515 4 3	12,543 1 4	7,853 8 6	53,952 14 5	2,58,949 2 3

Annual Form No. 49.—[*Prescribed.*]

Forest Department, Punjab.

Summary of Expenditure of the different Divisions, 1877-78.

BUDGET HEADS. B.—Establishments.	Direction.	Sutlej Division.	Beas Division.	Ravi Division.	Chenab Division.	Jhelum Division.	Rawalpindi Division.	Fuel Reserve Central Division.	Fuel Reserve Northen Division.	Plantation Division.	Total.
Brought forward, Total A. Conservancy and Works	571 9 6	7,030 .. 11	14,707 6 2	27,202 4 1	30,720 4 6	1,00,852 12 7	3,515 4 3	12,543 1 4	7,853 8 6	53,952 14 5	258,949 2 3
I.—Salaries:—											
a. Conservators	18,432	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	18,432 ... ...
b. Superior Officers	8,948 6 2	5,470 15 5	12,027	9,657 ... 2	5,400	12,054 9 ...	6,450	18,700	6,993 8 9	7,564 6 10	93,265 14 4
c. Subordinate Forest and Depôt Establishments	... ...	4,355 8 3	10.022 7 10	5,421 13 11	6,856 ... 3	6,498 11 ...	5,427	20 229 9 1	9,184 13 2	7,302 ... 10	75,298 ... 4
d. Office Establishments ...	7,767 8 10	900	1,235 15 6	1,455	2,242 2 11	1,667 2 8	414 10 ...	1,740	950 4 8	1,752	20.124 12 7
e. Deputation and Special Allowances	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...
II.—Travelling Allowances:—											
a. Conservators	1,191 1 ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	1,191 1 ...
b. Superior Officers	1,307	1,525 12 ...	2,291 12 ...	3,422 9 ...	1,115 8 ...	4,242 12 ...	1,288 8 ...	4,454 8 ...	1,562 6 2	3,156 8 5	24,367 3 7
c. Subordinate Forest and Depôt Establishments	... ...	923 9 8	1,821 14 7	446 5 9	1,300 15 6	1,353 ... 10	534 13 5	1,516 5 11	652 7 1	1,107 2 2	9,656 10 11
d. Office Establishments ...	632 14 3	240 8 1	495 ... 4	539 15 1	380 ... 8	399 8 10	80 10 3	359 ... 8	180 2 6	415 4 7	3,723 3 3
III.—Contingencies:—											
a. Stationery	521 ... 1	35	136 1 2	52 14 6	87 3 9	143	159 10 ...	246 6 6	118 13 1	109 7 3	1,607 11
b. Carriage of tents and records ...	303 5 9	245 11 ...	237 11 1	406 7 6	353 6 3	290 4 ...	120 13 4	315 2 1	207 10 ...	8 4 6	2,488 11
c. Pay of Police Guards ...	... ...	264	... ...	... ...	286 1 1	184 10 9	... ...	... ...	... ...	.. ..	734 11
d. Sundries	818 0 6	597 9 3	535 10 8	421 8 6	660 ... 2	776 11 11	216 4 5	291 12 3	506 15 11	280 6 7	5,105 0
e. Official Postage	644 3 6	65 9 6	291 1 ...	101 15 ...	158 7 6	150 5 ..	149 6 ...	313 15 6	216 4 ...	129 ... 6	2,220 3
Total, B. Establishments ...	40,555 10 1	14,624 3 2	29,094 10 2	21,925 9 5	18,839 14 1	27,760 15 ...	14 841 11 9	48,166 12 ...	20,573 5 4	21,824 9 8	2,58,217 4
Grand total of Expenditure ...	41,137 3 7	21,654 4 1	43,802 ... 4	49,127 13 6	49,560 2 7	1,28,6[illegible]6 11 7	18,357 ... 2	60,492 10 4	28.426 13 10	75,754 3 1	5,17,166 6

Annual Form No. 50.—[*Prescribed.*]

FOREST DEPARTMENT, PUNJAB.

Account Current for the year 1877-78.

Dr.

Cash Balance ...	...	...	...	a37,660	9	1
Revenue realized in cash, Sutlej Division ...	59,273	10	9			
Beas „ ...	49,234	5	9			
Ravi „ ...	70,705	6	7			
Chenab „ ...	42,512	14	8			
Jhelum „ ...	99,368	14	2			
Rawalpindi „ ...	32,428	4	4			
F. R. Central „ ...	1,27,589	15	8			
Do. Northern „ ...	56,276	6	8			
Plantation „ ...	11,745	11	11			
Direction „ ...	7	15	0	5,49,143	9	6
Revenue adjusted by Book Transfer.						
State Railways ...	96,650	11	8			
Public Works Dept....	28,087	3	8			
Military Department	7,324	5	9			
Police Department ...	911	2	4			
Inland Customs Dept.	1,364	14	2	1,34,566	12	2
Remittances from State Treasuries ...	...		...	5,18,441	11	10
Advances Recoverable ...	...	...	..	1,18,173	13	8
Public Works Dept. ...	1,571	7	5			
Thomason College ...	35	12	0			
Jails ...	988	14	9	2,596	2	2
Contribution to Funds.						
Uncovenanted Service F. P. Fund ...	2,531	4	0			
Bengal Military & O. Fund ...	57	12	0			
Madras Military Fund ...	720	2	0			
Civil Ordinary Fund ...	480	0	0	3,789	2	0
Deposits ...	...	...	...	4,658	2	0
Suspense Account ...	...	...	...	2,718	7	0
Chamba State ...	...	...	..	7,200	0	0
Bahâwalpur State ...	...	...	...	2,712	2	1
Imprest Advances ...	...	...	...	1,400	0	0
Total ...	...	...	...	13,83,060	7	6

Cr.

By expenditure under A.	Sutlej Division ...	7,030	0	11			
	Beas „ ...	14,707	6	2			
	Ravi „ ...	27,202	4	1			
	Chenab „ ...	30,720	4	6			
	Jhelum „ ...	1,00,852	12	7			
	Rawalpindi „ ...	3,515	4	3			
	F. R. Central „ ...	12,543	1	4			
	„ Northern „ ...	7,853	8	6			
	Plantation „ ...	53,952	14	5			
	Direction „ ...	571	9	6	2,58,949	2	3
By expenditure under B.	Sutlej „ ...	14,624	3	2			
	Beas „ ...	29,094	10	2			
	Ravi „ ...	21,925	9	5			
	Chenab „ ...	18,839	14	1			
	Jhelum „ ...	27,760	15	0			
	Rawalpindi „ ...	14,841	11	9			
	F. R. Central „ ...	48,166	12	0			
	„ Northern „ ...	20,573	5	4			
	Plantation „ ...	21,824	9	8			
	Direction „ ...	40,565	10	1	2,58,217	4	8
3 Refunds and drawbacks ...		...	...	...	774	7	3
28 Miscellaneous ...		...	...	...	45	9	0
Revenue Remittances.							
State Treasuries ...		...	...	...	5,47,421	1	1
Do. adjusted by Book Transfer ...		...	...	...	1,34,596	12	2
Remittances, Public Works Departments...		...	...	...	43	3	3
Advances Recoverable ...		...	..	...	1,53,168	7	7
Imprest Advances ...		...	...	...	1,450	0	0
Provincial Services ...		...	...	...	2,690	2	0
Deposits ...		...	...	...	2,583	0	0
Suspense Account ...		...	...	...	2,942	11	0
Cash balance on 31st March 1878...		...	...	...	20,178	11	3
Total ...		...	...	...	13,83,060	7	6

a Increased by Rs. 96-10-0 remittance from Treasury omitted by Fuel Reserve Division.

Annual Form No. 51.—[*Prescribed*].

Forest Department, Punjab.

Statement of Outstandings and Liabilities on account of Contractors, 1877-78.

Division.	Department Debtor. At commencement of year.	Department Debtor. Recoveries in cash and value of supplies and work done during the year.	Department Debtor. At close of year.	Department Creditor. At commencement of year.	Department Creditor. Payments made during year.	Department Creditor. At close of year.	Balance due. To Department (Outstandings).	Balance due. By Department (Liabilities.)	Remarks.
Sutlej ...	...	125	125	125	...	125	...		Charged to C. & Working
Do. ...	...	1,103 7 10	1,103 7 10	...	1,222 14 9	1,222 14 9	119 6 11		do. „ A. Recoverable
Beas ...	...	13,688 6 5	13,688 6 5	A. 14,605 2 6	...	14 605 2 6	916 12 1		do. „ C & Working
Do. ...	...	24,221 13 9	24,221 13 9	..	40,236 15 7	40,236 15 7	16,015 1 10		do. „ A. Recoverable
Ravi ...	2,351 1 ...	1,938 6 5	4,289 7 5	4,459 3 3	2,264 1 1	6,723 4 4	2,520 12 10	86 15 11	do. „ C & Working
Do. ...	...	36,727 1 9	36,727 1 9	...	40,775 1 ...	40,775 1 ...	4,047 15 3		do. „ A. Recoverable
Chenab ...	...	144 12 2	144 12 2	144 12 2	...	144 12 2	...		do. „ C & Working
Do. ...	...	679 2 4	679 2 4	...	759 2 4	759 2 4	80		do. „ A. Recoverable
Jhelum ...	...	3,000	3,000	3,200	...	3,200	200		do. „ C & Working
Do. ...	...	10,377 1 3	10,377 1 3	2,277 9 5	17,043 3 8	19,320 13 1	8,943 11 10		do. „ A. Recoverable
Fuel Reserve Central ...	...	7 12 11	7 12 11	1,811 4 11	...	1,811 4 11	1,803 8 ...		do. „ C & Working
Ditto ...	...	...	...	D. 73,849 9 8	7,000	80,849 9 8	B. 80,849 9 8		do. „ A. Recoverable
Fuel Reserve North ...	...	848 4 10	848 4 10	C. 1,217 1 9	...	1,217 1 9	368 12 11		do. „ C & Working
Ditto ...	...	1,197 13 ...	1,197 13 ...	D. 1,686 1 4	1,257 13 ...	2,943 14 4	1,746 1 4		do. „ A. Recoverable
Plantation ...	...	1,470	1,470	E. 1,848	...	1,848	378		do. „ C & Working
Do. ...	...	41,427 5 9	41,427 5 9	...	42,448 5 3	42,448 5 3	1,020 15 6		do. „ A. Recoverable
Direction ...	...	2,440	2,440	185	2,425	2,610	170		do. „ A. Recoverable
Total ...	2,351 1 ...	1,39,396 8 5	1,41,747 9 5	1,05,408 13 0	1,55,432 8 8	2,60,841 5 8	1,19,180 12 2	86 15 11	

A.—Erroneously shown as Rs. 15,560-3-6.
B.—Of this amount Rs. 73,750 is due by Sekandar Khan.
C.—Erroneously shown as Rs. 1217-9-10
D.— Do. Rs. 1285-9-3
E.— Do. Rs. 1470-0-0
D.— Do. Rs. 73,849-10-8

Annual Form No. 52.—[*Prescribed.*]

FOREST DEPARTMENT, PUNJAB.

Statement of outstandings on account of Revenue, 1877-78.

DIVISION.	Particulars.	Outstandings at commencement of year.	Value of sales and other revenue during year.	Total.	Amount realized during year.	Balance due to the Department at end of year.	REMARKS.
Sutlej	Timber, firewood and bamboos ...	A. 4,831 12 0	1,31,052 7 1	1,35,884 3 1	A. 1,35,884 3 1	... ...	A Includes Rs. 4,831 anas 12 written off.
	Grazing and fodder grass ...	... ...	285 0 9	285 0 9	285 0 9	... ...	
	Miscellaneous ...	... ...	15,200 4 2	*15,200 4 2	15,200 4 2	... ...	
Beas	Timber, firewood and bamboos ...	3,778 2 2	44,123 4 1	47,901 6 3	45,583 0 8	2,318 5 7	
	Grazing and fodder grass ...	B. 916 0 0	2,455 15 9	3,371 15 9	3,371 15 9	... ...	B Omitted by divisional officer.
	Miscellaneous ...	... ...	1,343 9 11	1,343 9 11	1,343 9 11	... ...	
Ravi	Timber, firewood and bamboos ...	10,312 9 5	87,065 14 2	97,378 7 7	C. 90,606 9 7	6,771 14 0	C Includes Rs. 1,428 written off.
	Grazing and fodder grass ...	... ...	... ...	... ...	... ...	... ...	
	Miscellaneous ...	... ...	... ...	... ...	... ...	... ...	
Chenab	Timber, firewood and bamboos ...	7,253 15 0	47,691 9 4	54,945 8 4	47,691 9 4	7,253 15 0	
	Grazing and fodder grass ...	... ...	... ...	... ...	... ...	... ...	
	Miscellaneous ...	... ...	1,665 13 4	1,665 13 4	1,665 13 4	... ...	
Jhelum	Timber, firewood and bamboos ...	808 8 0	94,991 7 9	95,799 15 9	95,797 7 9	2 8 0	
	Grazing and fodder grass ...	... ...	7,654 1 5	76,54 1 5	7,654 1 5	... ...	
	Miscellaneous ...	... ...	7,769 7 1	7,769 7 1	7,769 7 1	... ...	
Rawalpindi	Timber, firewood and bamboos ...	... ...	27,778 1 6	27,778 1 6	27,778 1 6	... ...	
	Grazing and fodder grass ...	... ...	4,191 9 10	4,191 9 10	4,191 9 10	... ...	
	Miscellaneous ...	... ...	443 10 0	443 10 0	443 10 0	... ...	
Fuel Reserve Central...	Grazing and grass ...	17,468 10 1	1,03,582 12 10	1,21,051 6 11	1,02,507 4 0	18,544 2 11	
	Firewood and charcoal ...	2,549 0 2	30,363 10 6	32,912 10 8	30,100 10 8	2,812 0 0	
	Miscellaneous ...	1,710 7 0	250 4 1	1,960 11 1	1,658 11 1	302 0 0	
Fuel Reserve Northern,	Grazing and grass ...	*13,966 3 8	44,893 1 2	58,859 4 10	49,031 4 8	9,828 0 2	
	Firewood and charcoal ...	... ...	3,212 4 8	3,212 4 8	3,212 4 8	... ...	
	Miscellaneous ...	... ...	4,260 3 10	4,260 3 10	4,260 3 10	... ...	
Plantation	Thinnings and grass ...	1,792 11 11	7,367 13 7	9,160 9 6	7,521 7 7	1,639 1 11	
	Miscellaneous ...	... ...	4,216 4 4	4,216 4 4	4,216 4 4	... ...	
Direction	Ditto ...	... ...	7 15 0	7 15 0	7 15 0	... ...	
	TOTAL	65,387 15 5	6,71,866 10 2	7,37,254 9 7	6,87,782 10 0	49,471 15 7	

* Rs. 867-8-0 shewn in excess in last return.

Form No. 53.

FOREST DEPARTMENT, PUNJAB.

Statement of Trees felled during the year 1877-78.

Division.	Forest Range.	Locality.	Description of trees.	On hand from previous year.		Felled during current year.		Total.		Disposed of during current year.			Closing balance.	
				No.	C. ft.	No.	C. ft.	No.	C. ft.	How disposed of.	No.	C. ft.	No.	C. ft.
Jhelum ...	Kaghán ...	Kanári ...	Deodár ...	117	...	...	...	117	...	Logged ...	117	...	...	...
		Nuri ...		27	...	...	...	27	...		27	...	...	...
		Dhanna ...		243	...	235	...	478	...		478	...	...	...
		Duhar ...		...	...	241	...	241	...		241	...	...	...
		Bunja ...		...	...	226	...	226	...		226	...	..	...
		Batakundi ...	Pencil Cedar ...	...	...	20	...	20	...		20	...	...	...
Rawalpindi ...	Murree and Kahuta range ...	Various ...	P. Excelsa ...	...	...	11	...	11	...	Sold, &c. ...	11	...	...	...
			P. Longifolia ...	...	...	731	...	731	...		731	...	...	...
			Q. Dilitata ...	...	...	18	...	18	...		18	...	...	...
			Q. Incana ...	...	...	8	...	8	...		8	...	...	...
			Dalbergia Sissu ...	...	...	1	...	1	...		1	...	...	...
			Accacia Modesta ...	...	...	46	...	46	...		46	...	...	...
			" Catechu ...	...	..	12	...	12	...		12	...	...	...
			Olea (sp.) ...	...	...	121	...	121	...		121	...	...	...
			Sizygium Jambolanum ...	...	...	8	...	8	...		8	...	...	...
			Cornas Macrophylla ...	...	...	4	...	4	...		4	...	...	...
			Phoebe lanceolata ...	...	...	5	...	5	...		5	...	...	...
			Morus (sp.) ...	...	...	2	...	2	...		2	...	...	...
			Odina wodier ...	...	...	9	...	9	...		9	...	...	...
			Andrachne lanceolata ...	...	...	10	...	10	...		10	...	...	...
Chenáb ...	Pangi ...	Durwas ...	Deodár ...	...	...	98	...	98	...	Logged	98	...	...	...
		Kilar ...		...	...	155	...	155	...	...	155	...	...	...
		Purti ...		...	...	119	...	119	...	...	119	...	...	...
		Tindi ...		...	...	15	...	15	...	...	15	...	...	...
Ravi ...	...	Kalatop ...	Deodár ...	...	...	34	...	34	...	Sawn into scantlings ...	29	...	5	...
	...	Do ...	Tos ...	...	...	25	...	25	...	Ditto ...	13	...	12	...
	Banikhet ...	Banikhet ...	Chil ...	...	...	31	...	31	...	Sold and removed by purchasers	31	...	...	...
	Bakloh ...	Bakloh ...	Do. ...	...	...	69	...	69	...		69	...	...	...
	Suil ...	Duir ...	Deodár ...	...	...	4	...	4	...	Logged and launched ...	4	...	...	...
	Tisa ...	Bagotanear ...	Do. ...	...	...	250	...	250	...	Ditto ...	250	...	...	...
	Bassu ...	Bassu ...	Do. ...	...	...	45	...	45	...	Given for state purpose ...	45	...	...	...
	Upper Ravi ...	In Chamba ...	Do. ...	...	...	223	..	223	...	Given to zamindárs by Supt. of Chamba.	223	...	...	...
	Ditto ...	Ditto ...	Do. ...	...	...	28	...	28	...	Ditto ...	28	...	...	...
	Ditto ...	Ditto ...	Chil ...	...	...	88	...	88	...	Ditto ...	88	...	...	...
	Ditto ...	Ditto ...	Tos ...	...	...	27	...	27	...	Ditto ...	27	...	...	...

Beás ...	Kulu ...	Various ...	Deodár ...	...	...	1,464	83,900	1,464	83,900	For P. W. and sawn into scantlings.	1,464	83,900	...	...
			Kail ...	...	...	1,460	36,575	1,460	36,575	Gratis to zemindars.	1,460	36,575	...	...
			Rai ...	...	...	30	750	30	750		30	750	...	...
	Dera & Hamirpur	Various ...	Chil ...	...	...	1,461	20,523	1,461	20,523	For Civil Works to zemindars at reduced rates to traders & auctioned.	1,461	20,523	...	...
			Sal ...	...	...	180	180	180	180	Do.	180	180	...	...
			Miscellaneous ...	...	...	126	572	126	572	Auctioned.	126	572	...	...
	* Hoshiárpur and Nùrpur ...	Various ...	Chil ...	...	...	273	10,920	273	10,920	...	273	10,920	...	...
			Sal poles ...	...	...	2,941	2,941	2,941	2,941	...	2,941	2,941	...	...
			Other trees ...	...	...	183	738	183	738		183	738	...	...
Fuel Reserve Northern	Chakwál ...	Drangon ...	Kan ...	...	...	100	...	100	...	Sold	100	...	...	...
			Total	387	...	11,137	1,57,099	11,524	1,57,099	...	11,524	1,57,099	...	...
Fuel Res. Central.	Lahore ...	Various	Jand and Kail ...	...	...	...	4,52,333	...	4,52,333	Sold	...	4,52,333	...	...
	Gujránwála ..		Dito	...	...	...	3,81,250	...	3,81,250	Ditto	...	3,81,250	...	...
	Montgomery ...		Dito	...	...	...	13,56,401	...	13,56,401	Ditto	...	13,56,401	...	...
	Mooltan ...		Dito	...	...	...	96,586	...	96,586	Ditto	...	96,586	...	...
Rawalpindi ...	Murree and Kahuta	Ditto	...	...	...	...	3,72,925	...	3,72,925	Ditto	...	3,72,925	...	...
			Total	...	...	...	26,59,495	...	26,59,495	...	...	26,59,495	...	...

* All were sold as grant but some classes have privileged rates.

Form No. 54.

FOREST DEPARTMENT, PUNJAB.

Statement of Logs, Sleepers, and other Scantling, cut and exported during the year 1877-78.

Division.	Forest Range.	Locality.	Description of timber and scantling.	On hand from previous year.		Cut during current year.		Total.		Disposed of during current year.			Closing balance.	
				No.	C. ft.	No.	C. ft.	No.	C. ft.	How disposed of.	No.	C. ft.	No.	C. ft.
Jhelum ...	Kaghán ...	Dhanna ...	Deodar ...	...	...	4,223	...	4,223	...	Launched ...	2,162	...	2,061	...
		Nuri ...	Do. ...	...	...	363	...	363	...		353	...	10	...
		Kanari ...	Do. ...	...	...	877	...	877	...		877	...	...	...
		Duhar ...	Do. ...	...	...	3,760	...	3,760	...		3,760	...	...	...
		Suki kass ... / Bagaban ...	Do. ...	4,275	...	...	...	4.275	...		2,732	...	1,543	...
		Bunja ...	...	...	...	1.915	...	1.915	...		1,906	...	9	...
		Kamalban ...	...	...	...	2,832	...	2,832	...		2,026	...	806	...
		Jhalgraon ...	...	...	...	408	...	408	...		408	...	...	...
		Batakundi ...	...	...	...	71	...	71	...		71	...	...	...
Chenáb ...	Pangi ...	Durwas ...	Dead and dry Deodár logs,	...	...	367	12,212	367	12,212	Launched ...	367	12,212	...	...
		Do. ...	Windfall do. ...	...	...	332	10,135	332	10,135	...	332	10.135	...	...
		Kilar ...	Dead and dry do. ...	...	...	859	24,995	859	24,995	...	859	24,995	...	...
		Do. ...	Windfall do. ...	...	...	2,184	34,855	2,184	34,855	...	2,184	34,855	...	...
		Do. ...	Do. Walnut ...	...	...	3	50	3	50	...	3	50	...	...
		Purti ...	Dead and dry Deodár logs,	...	...	653	22,362	653	22.362	...	653	22,362	...	...
		Do. ...	Windfall do. ...	...	...	3,218	53,814	3,218	53,814	...	3,218	53.814	...	...
		Tindi ...	Dead and dry do. ...	...	...	92	2,646	92	2,646	...	92	2,646	...	...
		Do. ...	Windfall do. ...	...	...	303	5,741	303	5,741	...	303	5,741	...	...
		Do. ...	Dead and dry I. Pines ...	1,284	12,840	3	213	1,287	13,053	...	3	213	1,284	12,840
Ravi ...	Kalatop ...	Kalatop ...	Deodár Scantlings, ...	196	298	264	255	462	553	Used by Department ... / Sold. ...	64 / 300	64 / 370	98	119
			Do. Slabs ...	...	...	14	18	14	18	...	...	...	14	18
			Tos Scantlings ...	1,113	1,647	1,224	1,209	2,337	2,856	Sold ... / Used by Department ...	2,011 / 135	2.425 / 148	191	283
			Do. Slabs ...	...	...	34	28	34	28	...	...	...	34	28
			Oak Scantlings / Do.	295	258	130	122	425	380	Used by Department ... / Sold. ...	3 / 278	2 / 263	144	116
Upper Ravi sub-division ...	Suil ...	Bhandal ...	Deodár logs ...	324	...	1,123	...	1,447	...	Launched ...	1,432	...	15	...
			Kail do. ...	...	...	27	...	27	...	Do. ...	27	...	...	...
			Tos do. ...	...	...	6	...	6	...	Do. ...	6	...	...	...
	...	Duir ...	Deodár do. ...	1,160	...	13	...	1,173	...	Do. ...	1,013	...	160	...
	Tisa ...	Bagota ...	Do, do. ...	183	...	1,478	...	1,667	...	Do, ...	1,667	...	...	...

Beás ...	Upper Beás ...	Dhangi ...	Deodár scantlings ...	4,391	13,745	...	...	4,391	13,745	Brought to river banks and launched.	4,384	13,737	7	8
		Sandhar ...	...	7,972	30,208	...	...	7,972	30,208		3,375	10,869	4,597	19,339
		Latura ...	...	...	...	1,202	4,180	1,202	4,180	...	...	...	1,202	4,180
		Blajdhar ...	...	...	...	7,007	24,638	7,007	24,638	...	...	...	7,007	24,638
		Saloun ...	...	...	...	2,674	9,356	2,674	9,356	...	...	...	2,674	9,356
		Jibi ...	...	...	...	300	1,053	300	1,053	...	...	...	300	1,053
		Bagruri ...	...	...	...	360	1,251	360	1,251	...	...	...	360	1,251
		Pokridhar ...	...	...	...	2,945	10,257	2,945	10,257	...	...	...	2,945	10,257
		Bakrialahal ...	...	...	...	2,071	7,186	2,071	7,186	...	...	...	2,071	7,186
		Nagadhar ...	...	...	...	4,107	14,250	4,107	14,250	...	...	...	4,107	14,250
	Lower Beás sub-division.	River Islands between Dada and Naushahra ...	* Deodár beams 18′ × 12″ × 8″	...	...	8	96	8	96	Rafted to sale depôt ...	8	96	...	...
			" scantlings 18 × 10 × 5	...	...	3	19	3	19	...	3	19	...	—
			" " 13 × 9 × 5	...	...	50	203	50	203	...	14	57	36	146
			" " 12 × 10 × 5	...	...	83	345	83	345	...	64	266	19	79
			" " 11 × 10 × 5	...	...	98	373	98	373	...	87	331	11	42
			" " 10 × 10 × 5	...	...	127	441	127	441	...	56	194	71	247
			" " 9 × 10 × 5	...	...	38	119	38	119	...	6	19	32	100
			" " 8 × 10 × 5	...	...	64	177	64	177	...	17	47	47	130
			" " 7 × 10 × 5	...	...	9	22	9	22	...	...	...	9	22
			" " 6 × 10 × 5	...	...	7	15	7	15	...	...	...	7	15
Sutlej ...	Bashahir ...	Tikru ...	Deodâr ...	1,232	...	...	...	1,232	...	...	...	...	1,232	...
		Nachar ...												
		Kilba ...												
			Total ...	22,433	58,996	47,929	2,42,636	70,362	3,01,632	...	37,259	1,95,930	33,103	1,05,703

* Sawn from stranded timber which could not profitably be removed in log.

Annual Form No. 55.—[*Prescribed*].

FOREST DEPARTMENT, PUNJAB.

Statement of Timber and other produce brought to Depôt from the different Forest Divisions, 1877-78.

Division.	Forest.	Description of Timber, &c.	No. of Pieces.	No. of C. ft.	Total of each Division. Pieces.	Total of each Division. C. ft.
Sutlej ...	Bashahir ...	1st Class Deodár ...	...	...	686	29,070
Beas ...	Upper Beas ...	Do. ...	...	...	210	9,527
Ravi ...	„ Ravi ...	Do. ...	...	...	2,328	55,930
Chenáb ...	Pangi ...	Do. ...	...	...	2,628	51,407
Jhelum ...	Kaghán ...	Do. ...	...	...	2,436	76,705
		Total ...	...	...	8,288	2,22,639
Sutlej ...	Bashahir ...	2nd Class Deodár ...	...	...	2,347	38,554
Beas ...	Upper Beas ...	Do. ...	...	...	172	2,941
Ravi ...	„ Ravi ...	Do. ...	...	...	3,748	46,146
Chenáb ...	Pangi ...	Do. ...	...	...	2,236	22,702
Jhelum ...	Kaghán ...	Do. ...	...	...	85	2,703
		Total ...	...	...	8,588	1,13,046
Sutlej ...	Bashahir ...	Pine logs ...	...	...	304	7155
Beas ...	Parbutti ...	Do. ...	...	...	104	2,166
Ravi ...	Upper Ravi ...	Do. ...	...	...	1,290	17,464
Chenáb ...	Pangi ...	Do. ...	...	...	431	4,673
Jhelum ...	Kaghán ...	Do. ...	...	...	477	9,086
		Total ...	...	...	2,606	40,544
Sutlej ...	Bashahir ...	Deodár Scantlings,	...	...	410	866
Beas ...	Seoraj ...	Do. 8 × 10 × 5	17	47	...	...
Do. ...	Do. ...	Do. 9 × 10 × 5	6	19	...	...
Do. ...	Do. ...	Do. 11 × 10 × 5	87	331	...	...
Do. ...	Do. ...	Do. 12 × 10 × 5	64	266	...	...
Do. ...	Do. ...	Do. 13 × 9 × 5	19	77	...	...
Do. ...	Do. ...	Do. 18 × 10 × 5	3	19	...	...
Do. ...	Do. ...	Do. 18 × 12 × 8	8	96	...	...
Do. ...	Do. ...	Sleepers 6 × 8 × 4	4	5	...	...
Do. ...	Do. ...	Do. 6 × 8 × 8	2	5	...	...
Do. ...	Do. ...	Do. 10 × 10 × 5	65	226	...	...
Do. ...	Mandi ...	Sleepers.	108	297	383	1,388
Ravi ...	Kalatop ...	Deodár Scantlings.	278	272	...	...
Do. ...	Do. ...	Tos Do.	1,258	1,236	...	...
Do. ...	Do. ...	Oak Do.	130	122	1,666	1,630
Jhelum ...	Dungagalli ...	Scantling of sorts.	...	...	33,453	42,054
		Total ...	...	...	35,912	45,938
Sutlej ...	Bashahir ...	Scraps and pieces.	...	...	1,176	4,365
Beas ...	Seoraj ...	Do. ...	...	...	48	46
Ravi ...	Upper Ravi ...	Do. ...	...	...	...	35,034
Chenáb ...	Pangi ...	Do. ...	...	...	546	2,617
Jhelum ...	Kaghán ...	Do. ...	...	...	1,006	4,024
		Total ...	...	...	2,776	46,086
		Fancy Wood.				
Sutlej ...	Kalesur ...	Sal poles ...	...	...	1,797	...
Beas ...	Solang ...	Walnut ...	...	...	1	4
Chenáb ...	Pangi ...	Pencil Cedar ...	6	90	...	...
Do. ...	Do. ...	Ash ...	3	28	...	...
Do. ...	Do. ...	Walnut ...	9	134	18	252
		Total ...	...	...	1,816	256
		Grand Total ...	...	...	59,986	4,68,509
	Miscellaneous					
Beas ...	Hoshiárpur & Dhumtal in Kangra	Bamboos ...	...	...	5,69,186	...

Annual Form No. 56 [*Prescribed*].

FOREST DEPARTMENT, PUNJAB.

Account of Timber and other Produce, 1877-78.

Particulars.	Pieces.		Total.		Particulars.	Pieces.		Total.	
	No.	C. ft.	No.	C. ft.		No.	C. ft.	No.	C. ft.
Balance in hand at commencement of year.					*Removed by Purchasers.*				
Deodár in log ...	24,920	3,39,104	...	...	Deodár in log ...	36,421	5,88,405	...	...
Pines in log ...	6,226	82,186	...	...	Pines in log ...	8,673	1,20,856	...	...
Scantlings of sorts ...	1,630	2,300	...	...	Scantlings of sorts ...	29,454	37,496	...	...
Fancy wood ...	50	383	...	...	Fancy woods ...	1,840	489	...	...
Scraps and pieces ...	4,594	16,715	*37,420	4,40,688	Scraps and pieces ...	3,117	46,779	79,505	7,94,025
Charcoal, maunds ...	4,139	...	4,139	...	Charcoal, maunds ..	1,437	.	1,437	...
Received during year.					*Lost or used by the Department.*				
Deodár in log ...	16,876	3,35,685	...	...	Deodár in log ...	67	1,836	...	...
Pines in log ...	2,606	40,544	...	...	Pines in log ..	124	1,340	...	...
Scantlings of sorts ...	35,912	45,938	...	...	Scantlings of sorts ...	205	228	396	3,404
Fancy wood ...	1,816	256	...	...					
Scraps and pieces ...	2,776	46,087	59,986	4,68,510	*Balance at close of year.*				
					Deodár in log ...	5,308	84,548	...	...
					Pines in log ...	35	534	...	...
					Scantlings of sorts ...	7,883	10,514	...	...
					Fancy wood ...	26	150	...	...
					Scraps and pieces ...	4,253	16,023	17,505	1,11,769
					Charcoal, maunds ...	2,702	...	2,702	...
Total ...	...	...	1,01,545	9,09,198	Total ...	...	...	1,01,545	9,09,198

* *Memo. of difference between closing balance for* 1876-77 *and opening balance for* 1877-78.

Particulars.	Closing 1876-77.		Opening 1877-78.		Remarks.
	Pieces.	Cubic ft.	Pieces.	Cubic ft.	
Deodár in log ...	24,684	3,38,174	24,920	3,39,104	37 logs = 856 cubic feet, 196 logs only and 3 logs = 74 cubic feet omitted by Beás, Ravi and Chenáb Divisions respectively.
Pines in log ...	6,226	76,177	6,226	82,186	6,009 cubic feet only omitted by Ravi Division.
Scantlings ...	1,437	1,821	1,630	2,300	193 Scantlings = 479 cubic feet omitted by Ravi Division.
Fancy wood ...	50	386	50	383	The trifling difference of [illegible] cubic feet due to a misprint.
Scraps and pieces ...	4,594	...	4,594	16,715	Cubic feet of scraps now entered.
Charcoal ...	4,139	...	4,139	...	No difference.

Form No. 57.

FOREST DEPARTMENT, PUNJAB.

Statement showing the amount realized *on account of the different classes of Timber and other Produce sold during* 1877-78.

DIVISION.	Description of Timber, &c.	No. of pieces, &c. sold.	Cubic contents.	Amount realized and due on account of sales.	Average amount per log, &c.	Average cubical contents of logs.	Average amount per cubic foot.	REMARKS.
Sutlej ...	Deodar ...	15,139	2,32.778	1,24,189 0 0	8 0 0	15	0 8 0	
	Pines ...	524	8,847	2,984 0 0	5 11 0	17	0 5 0	
	Sleepers ...	410	866	491 0 0	1 3 0	2	0 9 0	
	Sal poles ...	1,797	...	2,959 0 0	1 10 0	...	...	
	Scrap wood ...	114	117	71 0 0	0 9 0	...	...	
	Do. ...	1,062	4,248	177 0 0	...	...	...	
	Bamboos ...	...	...	181 0 0	...	...	...	
Beas ...	Deodar ...	1,755	39,879	28,701 0 0	16 0 0	23	0 11 0	
	Pines ...	635	11,987	1,956 0 0	3 0 0	19	0 2 0	
	Deodar sleepers ...	70	280	275 0 0	4 0 0	4	0 1 0	
	Bamboos ...	5,88,078	...	10,419 0 0	17 0 0	...	...	per 1000
	Miscellaneous ...	...	...	26 0 0	...	...	...	
Ravi ...	Deodar ...	9.721	1,44,857	63.780 0 0	7 0 0	15	0 7 0	
	Pines ...	5,243	65,789	15,280 0 0	3 0 0	12	0 3 0	
	Deodar scantlings ... / Tos ... / Oak ...	2,589	3,058	2,216 0 0	0 15 0	1	0 12 0	
	Fragments ... / Charcoal ...	2,791	...	3,417 0 0	...	...	...	
Chenab ...	Deodar ...	7,235	89,693	41,574 0 0	6 0 0	12	0 8 0	
	Pines ...	1,737	23,844	5,406 0 0	3 0 0	14	0 3 0	
	Fancy wood ...	43	489	343 0 0	8 0 0	11	0 11 0	
	Scraps ...	682	2,490	346 0 0	...	...	...	
Jhelum ...	Deodar ...	2,571	81,199	56.510 0 0	22 0 0	32	0 11 0	
	Pines ...	534	10,389	2.768 0 0	5 0 0	20	0 4 0	
	Scantlings ...	26,385	33,293	11.990 0 0				
	Shingles ...	6,05 250	...	2,421 0 0				
	Scraps ...	1,211	4,844	557 0 0				
Fuel Reserve Central ...	Fuel ...	...	1,21,177	6,743 0 0				
Plantation ...	Do. ...	...	9,770	592 0 0				
Fuel Reserve Northern ...	Do. ...	...	...	651 0 0				
	Total ...	...	...	3,87,023 0 0				

DEDUCT— Amount due but not realized during the year	5,275 0 0	
ADD— Balance	3,81,748 0 0	
Amount realized on account of former years	10,683 0 0	
Total shown as revenue on account of sales under Budget Head I ...	3,92,431 0 0	

Form No. 58.

Forest Department, Punjab.

Statement showing the amount expended on the different class s of Timber and other Produce brought to Depôt during 1877-78.

Division or Depôt.	Particulars of Timber, &c.	No. of Pieces.	No. of Cubic contents.	Expenditure. Timber expenses under A I.	Expenditure. Quota of all other expenditure chargeable against Timber, &c.	Expenditure. Total amount chargeable against Timber, &.	Average. Amount per piece.	Average. Cubic contents per piece.	Average. Amount per cubic foot.	Remarks.
Sutlej ...	Deodár ...	3,033	67,624	3,159 0 0	5,750 0 0	8,909 0 0	3 0 0	22	0 2 0	
	Pines ...	304	7,155	334 0 0	609 0 0	943 0 0	3 0 0	24	0 2 0	
	Scantlings ...	410	866	40 0 0	73 0 0	113 0 0	0 4 0	2	0 4 0	
Beas ...	Deodár ...	382	12,468	3,925 0 0	6,267 0 0	10,192 0 0	27 0 0	32	0 13 0	
	Pines ...	104	2,166	706 0 0	1,127 0 0	1,833 0 0	18 0 0	21	0 13 0	
	Scantlings ...	383	1,388	441 0 0	704 0 0	1,145 0 0	3 0 0	4	0 13 0	
Ravi ...	Deodár ...	6,076	1,02,076	22,636 0 0	8,770 0 0	31,406 0 0	3 0 0	13	0 3 0	
	Pines ...	1,290	17,464							
	Scantlings ...	1,666	1,630							
Chenab ...	Deodár ...	4,864	74,109	8,549 0 0	22,120 0 0	30,669 0 0	6 0 0	15	0 6 0	
	Pines ...	431	4,673							
Jhelum ...	Deodár ...	2,521	79,408	14,655 0 0	1,500 0 0	16,155 0 0	6 0 0	32	0 3 0	
	Pines ...	477	9,086					20		
	Scantlings ...	33,453	42,054	8,942 0 0	465 0 0	9,407 0 0	0 3 0	1	...	...
	Totals ...	55,394	4,22,167	63,387 0 0	47,385 0 0	1,10,772 0 0	...	...	...	...

FORM No. 60.

FOREST DEPARTMENT, PUNJAB.

Abstract showing the value of Timber and of Live and Dead Stock for the year 1877-78.

Description of Timber and other Stock.	On hand at commencement of the year.				Received during the year				Total				Sold, otherwise disposed of and lost during the year, and allowance for depreciation.				On hand at close of the year.				Cause of loss and other particulars.
	No.	*Value.*			*No.*	*Value.*			*No.*	*Value.*			*No.*	*Value.*			*No.*	*Value.*			
Timber (cubic feet)	*4,23,590	2,40,485	0	0	4,22,167	2,46,286	0	0	8,45,757	4,86,771	0	0	7,50,161	3,60,540	0	0	95,596	58,444	0	0	Deodar valued at 10 annas per cubic foot, 12 annas was too high.
Fancy wood (No). ...	50	50	0	0	1,816	1,816	0	0	1,866	1,866	0	0	1,840	3,448	0	0	20	20	0	0	Pines valued @ 0-5-4 do.
Broken pieces (cubic feet.)	16,715	919	0	0	46,087	2,535	0	0	62,802	3,454	0	0	46,779	4,319	0	0	16,023	1,001	0	0	Scantlings @ 8 annas per cubic foot. Pieces at 1 anna per cubic foot.
Charcoal (maunds.)	4,139	4,139	0	0	...	...	...	...	4,139	4,139	0	0	1,437	961	0	0	2,702	2,702	0	0	
Live and Dead Stock (As per divisional returns).	...	88,126	0	0	...	17,352	0	0	...	1,05,478	0	0	...	5,317	0	0	...	1,00,161	0	0	
Total ...	6,44,494	3,33,719	0	0	4,70,070	2,67,989	0	0	9,14,564	6,01,708	0	0	8,00,217	3,74,585	0	0	1,14,341	1,62,328	0	0	

NOTE.—Difference in value at commencement and close of the year, Rs. 1,71,391.

* For difference in opening balance, see form 56.

DISTRICT AND CANAL ARBORICULTURE REPORT, 1877-78.

1. In submitting my report on District and Canal Arboriculture for 1877-78, it has to be noted that the season was extremely unfavorable.

The tabular return which now accompanies the report is the first of its kind and is imperfect, as is to be expected.

A large number of districts have sent no return at all.

2. I find it practically impossible to give the *details* of each district in any combined or general return; the cost of printing would be too great.

In future, while I would recommend District Officers to let each tahsíl keep up its register showing each road, &c., separate, it will then be sufficient if in the annual report a total length of *road in each tahsíl dealt with in the year* is given. Groves, plots and gardens may be stated separately.

3. Many officers seem not to have quite understood how to prepare the returns. One district has given a very long list of all the roads (apparently) in each tahsíl, whereas only those taken in hand for either extending *new work* or filling up and repairing gaps in *old*, should be shown. Supposing that at the beginning of the year, the tahsildár has received orders that 7 roads shall be dealt with, in the return *for this office*, I require only to know—

(*a*). The total length (lying within the tahsíl in question) of the roads.

(*b*). Of this, what length has never been planted or at least has utterly failed in the past?

(*c*). And what length has been planted, but is still full of gaps and blanks, requiring to be gone over and filled up?

(*a*) is added in brackets in the 3rd column; (*b*) is shown in the 4th column, and (*c*) in the 5th. This information gives, it will be observed, a complete account of the *status quo* of those roads. The rest of the columns simply indicate the work under two great heads, (I) going over and completing old work, and (II) doing new work (where there was none, or practically none, before). Under each there are 3 columns, as either may be "success," partial success, or "failure." Example:—

Supposing I have a road from Lahore to Shekupura; it is 14 miles, let us imagine, in all. Of this the first 5 miles have never been touched or have failed utterly, and 9 miles have been planted, leaving very many blanks. During the year I determine to complete the 9 miles. It may be that on miles 9, 10, 11, I succeed in filling up all blanks; that goes under "completing old work. Success." On the 12th and 13th miles I fill *some*, but not *all* blanks; that goes under the same head, but in the column "partial success," the 14th mile is bad soil, and my efforts to fill blanks are vain: this then goes under the same head, but column "Failure."

4. The Shahpur district in the table now printed shows how the thing may be correctly done.

5. It ought not be difficult to know what success has been attained. Planting is either done in the rains or in the early spring. In either case, as the report, say, for 1878, will come in about 1st June 1879, it ought to be possible to know what trees of the 1878 rains, or of February, March 1879 are then alive; if the greater part are alive when the report goes in June, "success" may be fairly reported.

The Deputy Commissioner Hoshiárpur has sent a valuable and complete form, but as it is only one out of a number, I hope he will give the prescribed form in future, to prevent mistakes in transferring his figures to this, which I have to do.

7. Very few districts have noticed what the condition as regards rain-fall of each tahsíl is; and some have given curious details. Núrpur is returned as "dry" with a rain-fall of 105 inches.

It will be well to drop fractions and take the nearest whole number of inches. The "classes," adopted in the Government of India's recently printed rain map are:—

(1). "Arid" less than 15 inches.
(2). "Dry" 15 inches to 30.
(3). Medium 30 to 75 inches.
(4). Moist 75 inches and over.

I refer of course to *average annual* rain-fall.

This information is noted on the tabular form, as it enables the reader to see at a glance, what sort of climate the work was done in.

8. I would invite the Deputy Commissioner of Hazára's attention to the splendid capability of the Pakli plain, and of the neighbourhood of Mansahra, for *Eucalyptus*, especially E. tereticornis, (which has flowered at Abbottabad) *E. resinifera*, *E. Rostrata*.

These might be sown near every village and along all roads and at waste places.

9. Dry districts still present the greatest difficulty, and failures even in better watered districts occur when the soil is bad. In all such places I can not recommend too strongly large cuttings of farásh-pieces, 4 feet long and 3 inches in girth set first in a nursery bed to get good roots formed. This species is infinitely better than nothing; it will often line roads and fill up gaps when other species fail; and it certainly has a faculty of improving the soil, so that after a few years, the "farásh" trees may be gradually cut away, and better trees planted in.

10. The *pipal* tree put in singly or two together at mile-posts, at corners of a road in the lower hilly tracts, and in such like places, will afford a resting place for travellers, where a regular avenue can not be attained. Pipal can be successfully cultivated to a considerable size in *pots*, and then planted out, sacrificing the pot by cracking it just before the tree is put into its hole. The hole may be well soaked with water first.

11. It is gratifying to observe that much more attention is paid to fencing before. In some districts, the prickly pear and the columnar *Euphorbia* will readily grow; here there is no excuse for not affording protection.

But I would urge that wherever it is worth while planting a tree, it is worth while protecting it. The cost of a kacha wall or a palisade, or a crate, is much less than is often supposed, and I am quite confident that it will be much cheaper in the end to protect the trees and put out a smaller number, than to use up all the available fund in planting a large number, at least half of which succumb to way side cattle.

12. The returns seem to show generally that much attention has been paid to completing old work before extending operations to hitherto untouched lines. This is to be commended; it is infinitely better to complete a few roads &c. thoroughly and then go on to new ones, than to undertake a great length of work which can only turn out to be very fragmentary and incomplete.

I would urge, especially in dry and difficult districts, that this should be specially borne in mind, and that the work should in all cases be very restricted in extent so as to enable the *greatest* care to be given to a *few* trees. In this way the battle will be won step by step, inch by inch. No other way is possible in such districts as Montgomery, Jhang, or Sirsa.

13. As regards Establishments the practice is very various. Some districts have a fixed staff of supervisors, subordinate supervisors and watchmen; others rely on coolies and "beldárs."

It is of course impossible to lay down any strict rule for every locality; but I think it should be borne in mind that if even a small staff is permanently kept, the new can learn practically and by experience how to plant successfully (not merely to stick trees into the ground), whereas coolies taken on new every year either have to waste much time in learning, or else do the work badly.

Peshawar.

14. The form has not been filled in this year. It is said (according to the former method which I hope will now be discontinued) that 38,974 trees of various kinds were put out along the roads.

The expenditure is sufficiently high for establishment to ensure good results if the work is systematically taken up. This establishment apparently *does not* include that of the Jhil plantation; on which a separate report was submitted to Government.

6 Jamadárs (5 on Rs. 10 and 1 on Rs. 12)=Rs. 744.
138 Gardeners at Rs. 5=Rs. 8,236.
11 Do. (6 on Rs. 9)=Rs. 936.
Cost of nurseries for road planting=Rs. 194.
Gardener's huts Rs. 90.
Cost of 10 "kacha" wells Rs. 898.
Miscellaneous, Rs. 210=Total Rs. 11,308.

The nurseries, when they have done their work, are left as permanent groves.

Kohat.

15. No return is given. It is stated generally that the Public Works Department supervises this work. The civil authorities planted 300 trees, of which 270 succeeded.

Hazara.

16. Only Rs. 500 was spent on this work during the year. No establishment is permanently kept up.

Eucalyptus is planted during rains, and other trees chiefly in winter. The Municipal nurseries at Abbottabad, Haripur &c., supply trees. There are no district nurseries. I have already recommended the species *Eucalyptus tereticornis* which flowered this year at Abbottabad, and will probably seed, (specimens were sent and so named at Kew) to be planted in the Pakli Plain.

Various trees have been planted in the Abbottabad station. It is hoped that now the *Eucalypti* at Abbottabad have been named, it will be possible largely to extend the growth of this species.

Dera Ghazi Khan.

17. This district alone represents the Deraját in the report.

The expenditure amounted to Rs. 3,523, which unfortunately includes Municipal expenditure, with which this report is not concerned.

32 Bhistís are apparently permanently maintained, and no other establishment, and on the plantation at Kotla Sikhani, there are two wells and 4 pairs of bullocks kept up.

Operations are apparently confined to 6 lines of road, which will be, I understand, persevered with, till they are actually finished. This is quite a wise procedure in a district where nurseries and widely scattered works are sure to fail. The "plantations" spoken of are in the Kotla Sikhani rukh, and it is intended to extend them by shisham sowings year by year.

Attention is also wisely paid to keeping up nurseries as sources of supply both to road work, and it is hoped gratuitously to applicants who may wish to put out trees on their own lands.

Siris as a tree is discouraged, and wisely so, as it suffers from frost, though *old* siris trees give a timber far from despicable. A magnificent specimen sent to Paris from Mooltan showed a very fine timber.

Kikar it is said grows in Kallar soil, but suffers from frost. It will be found however that for some reason or other one or two trees out of a lot will escape, and this is the reason I believe why kikar is always found in such very single or open growth all over the Punjab.

The Deputy Commissioner has tried "tun" with success, but found that some did not germinate. Tun seed is extremely perishable. The fact is, it begins to germinate directly it falls. It is necessary to collect it when first, but yet fully ripe and sow with the least possible delay. The cultivation of tun cannot be too strongly recommended.

Jhelum.

18. The expenditure has been :—

On nursery and garden	Rs. 1,723
On new trees, on roads	„ 1,418
Conservancy of trees	„ 805
Total ...	Rs. 3,946

Establishment

8	Mális (various grades,)	840
21	Coolies	1,232
13	Bhistis and Pakhális	842
1	Mate at 7	84
1	Jemadár at 5	60
1	Muháfiz at 12	144
	Total	3,002
	Grand Total	6,948

The establishment may be partly met from Municipal funds : the report is not quite clear

My report only deals with what is done by District Authorities from District funds,—not Municipal work.

Besides the work of filling gaps in previously attempted avenues, attention was paid (which is quite right) to nurseries in each tahsil, so that there may be sources not only for supplying the material required for road planting, but also for distributing trees to landowners who will plant them out by their wells.

Shahpur.

19. The total expenditure was ... ... Rs. ... 2,775

Of this the establishment was as follows :—

Cost of Málís at various gardens ... ... Rs. ...	1,257
5. Muháfiz for road side trees ... ... " ...	312
Cost of 8 pairs of bullocks and one buffaloe " ...	214
Total ... " ...	1,783

The kikar sowings shown in the table resulted in failure owing to the failure of rain.

Nurseries to supply trees for planting out, &c., were established both at Sodhi and the sadr station gardens.

GUJRAT.

20. Expenditure amounted to ... ... Rs. ... 1 512.

The road-side avenue establishment consisted of :—

1 Máli	at	Rs. 8 = 96
2 Watchers	at	Rs. 5 = 120
5 Coolies	at	Rs. 5 = 300
2 Bhistís	at	Rs. 5 = 120

There is a separate establishment for two tahsil gardens, and one at the Cemetery, Chilianwalla.

No new work was done during the year, and only one work of restoration is shown in the table. But in a narrative note it is said that "existing avenues act with due attention and replacement of withered trees," so that perhaps filling up of blanks was carried on over a larger length than appears from the table itself.

GUJRANWALA.

21. No return or remarks has been received.

LAHORE.

22. The work done is clearly shown in the table, but no return of expenditure or establishment has been made.

FEROZEPORE.

23. No return is given. It is stated that 11,216 trees were planted on roads, and 2,688 trees elsewhere.

No return is made of expenditure or establishment.

AMRITSAR.

24. The expenditure was Rs. 6,092.

The establishment kept is :—

1 Dárogha	at Rs.	40
1 Jamádár	„	8
3 Peons	at Rs.	5 & 6
3 Gardeners	at Rs.	7 and 6
37 Bhistís	„	5
26 Beldárs	„	5

Besides this a special establishment for the civil station was kept up :—

Of 1 Gardener	at Rs.	6
1 Peon	at „	5
4 Beldárs	at „	5
8 Bhistís	at „	5
1 Do. for 3 months.		

This establishment (together with contingencies) accounts for the whole expenditure, thus:—

General Arboriculture establishment ...	Rs.	4,776
Contingences	„	316
Special Civil lines establishment ...	„	867
Contingencies	„	133
Total		6,092

The work was so far successful that only one in eight trees failed.

A large nursery is maintained in the civil lines of 5 acres extent, which supplies trees all over the district. 14,000 trees are available, mostly shisham. Some are grown from seed, others from cuttings.

I cannot help thinking that if trees are taken for distant tahsíls, they must be more costly than would be the case if raised in smaller local nurseries.

Trees of one or two years old are found best for transplanting; and the rainy months are selected.

SIALKOT.

25. I shall be much obliged if the Deputy Commissioner will read the introductory remarks regarding the " partial success" column.

Expenditure has been :—

On new work	Rs.	1,659
Maintenance, &c.	„	1,701
Total ...	„	3,360

The establishment is:—

1 Supervisor of arboriculture at Rs. 20
10 Jamádárs (different rates pay.)
1 Duffádár at Rs. 6
11 Peons at Rs. 5 each.
19 Gardeners and 35 Bhistís (temporarily.)

Four nurseries are kept up on the Amritsar road.

During the rains trees are planted *with* earth, but in spring (Feburary and March) trees without earth succeed. Trees between 2 and 3 years and well shaped are selected.

Babúl thorn fences are used, also planting the young trees round with the *Euphorbia* (this I think is meant, but the report says cactus). Both the columnar *Euphorbia* and the curious flat-leaved *Opuntia* make excellent tree fences, where they will grow.

GURDASPUR.

26. The Gurdáspûr return is not very easy to understand ; and some items of expenditure are mixed up in the columns of work.

The expenditure in arboriculture has been:—

Gurdáspur Tahsil	Rs.	2,013
Batála	„	630
Shakargarh	„	360
Pathánkot	„	165
Total ...	„	3,168

Each tahsil has an establishment of gardeners and bhistís.

JULLUNDUR.

27. The expenditure was Rs. 1,530 (exclusive of an establishment kept on a " bir " or grazing tract at Sarangwál at Rs. 144).

The establishment is:—

1 Dárogha at Rs. 15 per mensem } These look after the 32 groves on the Sutlej.
6 Watchers at „ 4 „ }
1 Gardener at Rs. 10 „ } For Jullundur garden and Sadr nursery.
4 Coolies at „ 4 „ }

In each tahsil the road plantings, &c., filling up of blanks, are carried out by gangs of coolies employed also to repair the roads.

The total number of trees put down by this agency was, 11,480 trees on the road, and 9,500 seedlings or cuttings in the nurseries.

Previous to this year there has only been one central nursery at Jullundur. Now Captain Beadon has established one at each tahsil. This is an improvement. Of the 32 groves along the Sutlej on Government plots of sailaba, all are in good condition except 3. These groves are thinned out, and the thinnings sold.

An experiment has been made in sowing shisham broad-cast on sandy soil near Jullundur towards Kapurthala and on the Hoshiárpur road ; this has been successful, and is only another proof what might be done for the Hoshiárpur " chos, " if only Government would sanction the necessary officer and expenditure.

Attention has been wisely paid to the subject of fencing and protection for trees &c. Munj grass has been grown for the purpose ; but it has many drawbacks. The prickly pear (*Opuntia)* and *Euphorbia* do well.

28. Captain Beadon remarks on the great value line hedges would be in arresting the blowing of sand across country, which is very destructive ; also in preventing disputes about cattle trespass. The subject merits attention. I commend the *small* " ber " (*Zzyphis numularia*), also the shambálu (*Vitex negundo*) as worthy of trial ; both will grow easily with such a rain-fall as Jullundur has ; cold weather planting is found to be the most reliable.

29. The following remarks on the tallow tree and other experiments must be quoted from Captain Beadon's report. " Of imported plants, the Chinese tallow (*Enæcaria sebifera*) has proved a great success. It requires very little care ; is not attacked by goats and cattle ; forms a graceful tree of some 25 to 30 feet high, and affords excellent shade.

" This tree, which was introduced into the Province some 15 years back, is now thoroughly acclimatized, and yields seed in season in great abundance. The wood is good for nothing but fuel, but as an ornamental road side tree I know none more pleasing or better adapted. I should like much to know how the tallow can be extracted from the seed * and whether if this tree's cultivation is further encouraged,

* Quite easily, by slightly crushing or bruising the seed in its husk and nearly boiling it in water in " karahís ; " the melted tallow rises to the top, and on cooling can be taken off in a disc or cake.—B. P.

the produce in tallow could be made a paying business. In the way of fruit trees I may remark that during the year we have imported to Jullundur the Malta orange from Gujránwála, and that some 20 trees of this are thriving in the Queen's Gardens. By grafting we produced some 200 mango trees, which have been disposed of to the zamindárs of the district at very moderate prices."

HOSHIARPUR.

30. A very complete report has been sent, but as the form is the only one, and it is extremely difficult to adapt it to the general form in use, I hope the less complete but practically sufficient form circulated by the Financial Commissioner will be used in future; information as to establishment, costs, trees planted, methods preferred, &c., being given in a brief narrative form at the end.

The details were so numerous that I found it impossible in the time at my disposal to give more than the totals for each tahsíl. The original table shows that there are the following length of roads fairly planted up, and wanting only certain gaps to be filled.

Hoshiárpur	68	miles.
Garhshankar	58	"
Dasúya	161	"
Una	34	"
Amb	54¼	"
Total ...	375¼	"

And of a total of 17,257 trees planted out, only 1312 failed, leaving 16,945 success, besides 4 acres 2 roods, 28 poles of groves planted or sown.

There are also nurseries (one central one for each tahsíl) containing upwards of 15,500 young plants.

31. It is extremely satisfactory to learn that a supply of English saws and pruning knives was obtained from Calcutta, and lessons in pruning and thinning given to the whole establishment, taking advantage of the Deputy Conservator of Forests, Beas Division, being on the spot.

The cost of the establishment for the year was Rs. 4,068. Mr. Coldstream's remarks on experiments and on trees suited for planting are as follow:—

32. "The Hirek (*Diospyros montana*) has been found one of the most rapidly growing trees and otherwise very suitable for road sides. It is handsome, fairly umbrageous, and has excellent wood. The *pilkhan (Ficus infectoria ?)* and the Indian rubber tree *(Ficus elastica)* of the new trees tried, have also done well.

Eucalyptus of various species is under trial. Some sowings of 1876 are now 8 feet high at Dasúya. An avenue entirely of *Eucalyytus* has been planted out at Hoshiárpur; the trees are 3 to 4 feet high. There are some 800 or 900 *Eucalyptus* plants and seedlings in the nurseries.

The species now being reared are *Globulus, Rostrata, Saligna, Citriodora and Viminalis.* Some of the seeds you were good enough to supply me with. Others have been sent me by Dr. Brandis, by the Government of India, by Dr. Bonavia, and I have procured some very good seed from Hazára, and some *(Globulus)* direct from Portugal. I shall be glad to get as much more as can be spared, as much use might be made of it in this district where many species appear to thrive. A tree in my own garden, some thirteen years old, planted by Mr. Perkins, has yielded seeds this season. I think it is *E. saligna.*

"A good supply of carob tree seed was sent me by the Deputy Commissioner of Shahpur, and I procured another supply from Portugal. It has germinated and not very freely.

"The Australian Wattles which you sent me for trial have germinated but not very freely.

"I have recently made over the superintendence of arboriculture in the outlying parganahs to the District Engineer. Mr. Faddy will take a great interest in the work.

"I am sure that road side plantations or avenues ought to be much more remunerative than they are. I feel sure that they ought at least to pay for the arboriculture establishment; but I also think that when properly managed they ought to pay for the repairs of the road. A great deal of land is wasted on road sides which might be made to yield a profit. Where avenues are properly looked after and kept up, loppings, thinnings and dead timber, ought to bring in a handsome return. A small hurricane occurs almost regularly once a year, and then hundreds of trees in a district are pretty sure to be prostrated.

"I propose this year to attempt to breed *lac* on a system, on the road sides; and to plant hedges of prickly-pear *(Opuntia)* on which plant (it has now reappeared in quantity after 25 years' absence) the cochineal insect feeds, as a possible source of income. Mr. Faddy has recently suggested that bamboos be planted out largely on the road sides, a plant at once hardy, easily spread and valuable in the market. This will also be tried this year."

KANGRA.

33. The expenditure was Rs. 1,249, which included the cost of getting out a number of English trees for the Dharmsála Public Garden.

The establishment kept is:—

1 Gardener at Dehra	at	Rs. 5	per mensem.
1 Do. at Kulu	at	„ 6	„
1 Coolie at Dharmsála	at	„ 4	„

This is certainly *extremely* moderate. I fear that it could hardly have been sufficient to supervise the very considerable length of road over which repairs or filling up of gaps in the avenues was undertaken. I would invite the Deputy Commissioner's attention to the cultivation (wherever possible) on roadsides of clumps of the beautiful bamboo seen all about this district (the larger kind not the hard little *Dendrocalamus strictus*). Not only will these clumps be ornamental, but would pay well in the course of a few years as a portion of the stems could be cut and sold.

LUDHIANA.

34. On the work shown in the table Rs. 1,973 were expended, and Rs. 5,757 were added for maintenance of previous work. There is no special establishment maintained, the work is done by "beldárs" and labourers under supervision of the district overseer.

Difficulty is spoken of in getting young trees to plant out; and it is said that large numbers of trees will be obtained from Lahore.

It would be far cheaper and easier to establish good local nurseries—one or more in each tahsíl, and thus supply 2 or 3 years old trees shisham, pipal, and others for the work. The soil is favorable, and the blanks which require filling up are said to be chiefly caused by the ravages of cattle, and it is said that protective measure would necessitate an *enormous outlay*. I connot agree with this. If a tree is worth planting, it is worth protecting, and I would either determine not to plant trees at all, or else take a smaller number in hand in the year and protect with a dead thorn fence, or with a prickly-pear or Euphorbia circular hedge, or with some other device.

UMBALLA.

35. No operations were undertaken. Rs. 1,812 were spent on maintenance of the work of previous years. The establishment, if any, is not mentioned.

MOOLTAN.

36. Unnecessary trouble has been taken in filling in a large number of roads in the return which were not however touched during the year.

All that is wanted is to specify the roads that were *dealt with during the year*, otherwise than for mere maintenance, watering or fencing. By "being dealt with" I mean that either a *new* length that had never been attempted (or was a complete failure from former trials) or else a filling up of gaps and blanks in *old* work was undertaken.

No mention is made of establishment or expenditure.

MUZAFFARGARH.

37. There is no tabular return.

The expenditure was Rs. 2,084

The establishment consists of:—

1	Jemadár	costing (together with coolies temporarily employed) Rs 1,300.
7	Mális	
15	Bhistís	

The feed of bullocks kept at the wells cost Rs. 611.

A total number of trees 3,318 was put out. The chief number (1600) being on the road from the Sadr to Kuraishi, which nearly all failed (*viz* 1405 out of the 1600). This work, however, was an experiment carried out cheaply; the soil is "kallar," and other trees had failed. This time Kabuli kikar (*Parkinsonia*) was tried.

I would recommend giving this road one more trial with "farásh" (*Tamarix articulata*) taking large cuttings, pieces 4 or 5 feet long, about 3 inches in girth, setting them in a nursery bed till they have rooted, and then putting them out when the little rain likely to fall begins. I would also recommend *sowing* "Kabuli kikar" in small prepared patches *where the soil looks better*.

Trees 6 to 8 feet high which Major Harrington prefers, have no doubt a good chance, *if* well planted; but it should be borne in mind that they require *much* greater care than (speaking of shisham) trees 2 years old.

JHANG.

38. The expenditure was Rs. 3,652.

Gardeners and Bhistis	...	...	...	Rs. 2,490
Labour and trees &c.,	...	...	...	„ 648
Feed of bullocks	...	...	...	„ 350
Contingencies	...	...	...	„ 164
		Total	...	„ 3,652

The establishment is of 40 men at various rates of pay from Re. 1 to Rs. 10 per mensem and 16 pairs of bullocks.

15 Government wells are kept up, and 56 private wells give assistance in arboriculture operations.

Three nurseries for supplying trees are kept, *viz* at Jhang, Chiniot and Shorkot. Loppings (which are said to have been made carefully) fetched Rs. 135 by their sale.

MONTGOMERY.

39. In this district, Rs. 176 was paid in monthly sums to land-holders for watering and looking after trees in their neighbourhood at the rate of Rs. 2 per %. This appears to be confined to the Pákpattan tahsil.

The fixed establishment is :—

Okára ...	...	1 Bhisti at Rs.	5
Dipálpur ...	...	1 „ „	5
Chíchawatni	...	2 „ „	5
Gogara ...	...	2 Watchers „	5
Pákpattan ...	...	2 „ „	5

Also 1 Contractor at Rs. 4 for watering trees.

Total ... Rs. 44 per mensem.

This year cultivators were induced to raise plots of trees at 8 different wells to supply trees for planting out.

Trees are always protected by thorn fences.

HISSAR.

40. A tabular return has not been furnished. But a narrative report shows the following. (In the Sadr) road from Jail to Katcherry planted with shisham and farásh.

Additions have been made to the trees in the church and katcherry compounds and within the Jail and Municipal Hall enclosures.

Nurseries are maintained for the supply of trees in the park, and at the Public garden. 1,270 trees were put out on the main road from Hissar to Fatehabad; only 207 however survive. The ground at the Fatehabad *Paráo* has been increased by 240 trees, successfully.

On the road from Fatehabad to Sirsa 468 trees have been added. And considerable additions have been made to the kikar (sown) plantations on the banks of the Rungo nala.

(Bherwala tahsil) most of the trees put out failed owing to drought.

On the Hánsi, Bhiwani, Hansi-Hissar, Tosham, Mehan and Gohana roads small additions were made; many trees died but some few survive.

The season was very unfavorable, and the scarcity of fodder such that many existing groves were seriously damaged by lopping and hacking the branches.

The Commissioner had directed an attempt to be made to establish pipal trees, as these are not injured by cattle, and are respected by the people. About 50 have succeeded, but when, in the drought, the tanks dried up, nothing could be done.

ROHTAK.

41. It is to be regretted that no return is given; only the former practice of a total of trees without any locality. This leads to nothing; unless it is known that a certain length of road (however little) has been actually stocked, or a certain number of groves, gardens, plots, or enclosed spaces at definite points filled, it is impossible to say what progress is really being made.

The expenditure is not stated. The year was here as elsewhere however extremely unfavorable for arboriculture owing to drought.

SIRSA.

42. The same remarks apply to some extent. The season was very unfavorable. 130 pipal and other trees were put out at villages, and 2,700 trees on the banks of the *Guggar*.

Pipal trees were also planted at the mile stones on roads (an excellent plan), but the usual drought caused failure.

The expenditure was:—

Establishment	Rs.	213
Feed of cattle and contingencies	„	249
Rewards to persons who had exerted themselves in planting at villages	„	25
Total ...	„	487

Eucalyptus was tried (several species) and failed. It is sure to fail in this district. I would recommend keeping to the plan adopted hitherto, trying to get pipal trees all about, where regular avenues cannot be expected to grow, and encouraging little groves at villages and other convenient spots giving rewards to encourage exertion. The planting of the banks of the *Guggar* is a work which cannot be too warmly encouraged.

Karnal.

43. No report has been received.

Gurgaon.

44. It is much to be regretted that the return was not sent, as there is evidently material for it. Thus it would appear that on the:—

1 Gurgaon and Sohna roads.
2 Gurgaon Station roads.
3 Bahádurgarh road.
4 Kutab road.
5 Sohna and Palwal road.

There are considerable portions completely stocked with trees.

On No. 5 it is satisfactory to notice that 1,425 (tháonlás) kacha palisades were made to protect trees from cattle, and cost only Rs. 356.

The total expenditure has been Rs. 3,529. The establishment permanently kept, if any, is not stated.

The season was unusually disastrous. Even old trees died. The *Millingtonia hortensis* (wiláyti nim) will probably send up suckers from the roots.

It is a capital *station* planting tree, but is of no use as wood, and is very brittle. The same remarks are made as in Hissar about stripping the trees for fodder owing to severe drought.

Delhi.

45. The return has been promised but not received in time to include it.

Kikar sowings in trenches along roads (which in a good rain year will prove, I am sure, a cheap and desirable method of working) failed entirely owing to drought during 1877-78.

The Bela plantation is separately reported on

The Municipality pays for a supervision and planting within municipal limits, and spent a sum of Rs. 4,062 on this work.

The District expenditure has been:—

Establishment on roads	Rs.	252
Ditto on other planting work	„	298
Expenditure on planting	„	276
Total ...	„	826

CANAL ARBORICULTURE.

46. Again for another year, the work is described in a series of notes. Since this report was written, a form which is extremely simple has been devised, and this in future years will show the progress made in a more tangible form.

The Bari Doab Canal (1st Division.)

47. The work on the *main line* and its rájbahas was this:—

	Trees.
Planting Bombay mangoes	175
Grafting Ditto	225
Planting out young trees	3,890

On the main upper branch :—

Tun, shisham and mulberry transplanted	10,750
Trees trimmed or pruned	2,000
Trees covered with grass thatch as protection against frost...	5,000
Earthen mound fences	2,10,000

On the Kasur branch, commenced in August 1877, 5 acres were ploughed and sown with tun, shisham and mulberry.

On the Sobraon branch, commenced in the same month, 40 acres were ploughed, and three acres sown, 25,000 feet of running fence were put up.

The *expenditure* has been for the year :—

Main Line and Upper Branch.

Establishment including travelling	Rs.	885
Work and maintenance	„	3,004
Total ...	„	3,889

Kasur and Sobraon Branches.

Establishment	„	190
Work and maintenance	„	1,400
Total ...	„	1,590
Grand Total ...	„	5,479

The *Receipts* were

Main Line and Upper Branch.

Sale of wood	Rs.	3,396
Mulberry leaves	„	61
Grass and grazing	„	1,778
Fruits	„	549
Total ...	„	5,784

Kasur and Sobraon Branch.

Grazing	„	41
Grand Total ...	„	5,825

These receipts are smaller than those of last year; but in that year there was an exceptional demand for wood for canal work, and a large number of trees were available for sale, being blown down by storms.

Bari Doab (2nd Division).

48. A very great deal of work was done in thinning, but owing to the unfavorable season planting and sowing operations were restricted.

There are now numerous *Eucalypti* doing well at the "chaukis" along the canal. The seed was obtained from Queensland; and is said to consist of the following:—

E. hemiphloia.	*E. Melanoxylon*
E. paniculata.	*E. globulus Jasmineus* (*sic.*)
E. bicolor.	

30,000 maunds of thinnings were sold as fuel. What the "new work" was, that appears in the following, is not stated.

Expenditure :—

	Rs.
Establishment including travelling allowance	1,425
Maintenance	5,629
New work	2,065
Total ...	9,119

Receipts :—

Sale of fuel	6,000
Grass and "kána"	3,291
Total ...	9,291

The results of both these divisions must be regarded as satisfactory. They both pay their way completely.

Lower Sutlej and Chenab Division.

49. The increase to trees was chiefly the result of natural seedlings; but considerable thinnings have taken place also. A number of "sissu" trees were blown down during storms. These were not replaced, partly as funds were not sufficient, and partly because the trees were too close to the water's edge.

No land exists beyond the actual canal banks which can be utilized for planting. An elaborate list of trees is given. Mr. O'Brien properly objects to the calculation of a total by a multiple of a result obtained on a certain area. Such a multiple is only correct when the sample selected is really a fair average of the whole, and this it is impossible to obtain where a line consists of many miles length, some parts thickly stocked, others poorly, and much still quite bare.

The countings were obtained during clearing work by actual enumeration of the length of line under clearing operations in each day.

The enumeration would be too long to reproduce, and even then it gives no idea of the actual length of line stocked in double or single lines or in a narrow belt or strip.

The principal species on the 1st April 1878 may however be thus summarized.

Tree.	Chenab Sub-Division.		Sutlej Sub-Division.	
	Planted.	Self-sown.	Planted.	Self-sown.
Shisham	3,094	11,558	901	1,450
Kíkar	4,362	16,324	1,276	13,506
Tamarisk	653	7,856	306	20,605
Ber	667	3,616	178	3,424
Date Palm	51	4,870	73	6,326
Mulberry	447	384	24	10
Mango	83	484	26	8
Jál (*Salvadora*)	...	1,599	21	2,519
Jand	108	11	32	672

The expenditure was:—

Establishment	Rs. 910
Work	Rs. 130
Total ...	Rs. 1,040

The income was:—

From sale of wood	Rs. 3,282
From Múnj and Kána grass ...	Rs. 2,499
Total ...	Rs. 5,781

Upper Suttej Inundation Canals.

50. No planting works were undertaken, because of the bad season.

The area covered with plantations or canals, including spoil banks, Canal chauki enclosures, and other lands along the canal works, is said to be 1,500 acres. The total length in miles is about 249 at present.

Most of the trees are of spontaneous growth consequent on the effects of water.

No financial results are reported.

Indus Canals.

(Dera Ghazi Khan).

51. The Executive Engineer has been at almost unnecessary pains to trace the increase and decrease of particular species in detail.

General remarks on the increase of species would suffice, as these are very interesting.

The chief thing is to be assured that steady progress is being made both naturally and artificially in stocking a definite length of available line, and a definite area of chauki enclosures and other plots of land connected with canal woks.

The total of trees shows 92,274 and increase of over 19,000 from last year. The ber, the date palm, the unfortunately worthless jál, (*) jand, kikar, shisham, and tamarisk attract the eye at once by the length of figure in which they are denoted. A few tallow trees, *Enaecaria sebifera*, also appear. These, if they take kindly to the soil, will soon spread naturally.

Plantation work consisted in putting out about 28,000 trees, which total is made up chiefly of shisham, though it includes a number of mango, a few oranges, pomegranates, banyan trees, 54 Eucalyptus and 50 carob trees (now called *Prosopis dulcis*).

I should remark that teak is not the same as *Terminalia glabbra*, so that it is not quite certain whether teak itself (*Tectona grandis*) or the *Terminalia* has been introduced. *Three Eucalypti* have taken a height of 10 to 12 feet. A number of "tun" are also succeeding well.

The expenditure was:—

Establishment	Rs. 899
Expenditure on work	„ 5,000
Total	„ 5,899

The income was:—

Sale of wood	„ 822
Sale of grass	„ 86
Total	„ 908

The expenditure of Rs. 5,000 was chiefly (*viz.*, Rs. 3,240) on account of 45 bhistís who water and also guard the trees. Each man has about 620 of the *planted* trees to look after, so that about Re. 1 is spent in the year on every 10 trees. As long as this secures a good growth, and can be stopped after the first 3 or 4 years, the cost is not excessive.

Sirhind Canal.

52. This canal (main line) being still under construction, some portions cannot be taken in hand owing to the damage that would result to young trees while the work is in progress, and others can not succeed till water is let on. But there is no doubt that what has been done is judicious, and that this canal line will show most excellent results in the course of time. Planting out is adopted where supervision and water are available, and where valuable trees can be grown with profit. In other places broad-cast sowing, especially of kíkar, is adopted, and the spoil banks thus trenched soon show with the aid of natural rain-fall, a well grown thicket which is then thinned out.

There are sandy portions of the canal line which as yet have resisted efforts to plant or sow them, But no doubt when the water is let on, the ground level of moisture will be raised, and it is possible that kíkar or even shisham will succeed. If not I recommend that at first stout cuttings of *tamarisk* be tried, as these no doubt really do improve and extract salts from the soil. After some year's growth they are gradually cut out, and better species interplanted till the tamarisk has disappeared altogether.

At Rupar itself some teak trees have been planted, and a number of *Eucalypti*, sown, which I believe to be *E. rostrata*, and some *E. saligna* were doing well when I was there in November.

The universal scarcity of rain in the plains retarded arboriculture operations considerably.

In *the* 3rd *Division* an area of 250 acres had been sown broad-cast with shisham and kíkar, which succeeds very well, though frost attacks the kíkar.

Besides this area so broad-cast sown I understand there are over 13,800 planted trees in avenues or lines, covering about 17 miles of line on either side of the canal. The chauki compounds are also all planted. The drought of this year cost the loss of many young trees.

In the *6th Division*, and in the 1st and 3rd sub-divisions, large nurseries exist containing about 20,000 plants, of which 14,000 have been put out in lines and in the Canal chauki compounds.

On the 2nd feeder 2 miles have been planted out with 800 trees. On the 3rd feeder 9 miles with 3,600 trees. On the Patiála irrigation channel the same. On the Gagar branch 5 miles with 2,000 trees.

* It has the merit of giving shade however as no one thinks of cutting it for fuel even.

WESTERN JUMNA CANAL.

53. In the Karnál Division of this canal 100 tun and shisham were put out in No. 3 plantation on the Soan. The mango gardens at Karnál and Abdullapur were tended.

The expenditure was	... ...	Rs. 350
The receipts :—		
Sale of mangoes	... ...	„ 384
Sale of wood	... ...	„ 4,218
	Total ...	„ 4,602

54. In the Delhi Division, Mr. Phelan reports that the season was too bad for extensive planting, but the existing mango garden and other plantations were kept under care, and a few trees planted in spring 1878 on rájbahas No. IX and No. XII.

A good deal of thinning and collection of fallen wood was undertaken, producing 21,264 maunds of fire-wood, and 525 cubic feet of timber.

At the new chauki compounds of Isrána and Saraklbál some trees of a species called "jámoa" were planted. It is spoken of as a wild jáman. The wood is very much valued in the neighbourhood, and Mr. Phelan has been good enough to offer some seed for trial in the Chánga Mánga plantations.

Some seed was employed on the Bari Doáb canal in 1875, and was sown in the Amritsar district between Jaitowal and the grand trunk road. The tree is hardy, and survives both swamp and kallar or "reh" in the soil.

This tree is probably *Eloeodendron Roxburghii.* [Dr. Stewart doubtfully assigns the name "jámoa" also to *Schleichera trijuda.*]

Some seed of *Eucalyptus* was obtained from trees which seeded on the island at Madhopur, but though raised in pots, and carefully treated, it succumbed to the unusually hot dry winds.

Mulberry trees, it is noted, are nearly always unsound. This is no doubt true, but it very frequently arises in road side plantations, either from lopping or from a branch being torn off: the seed in either case never heals and gives rise to a *caries.* No mulberry tree should ever be pruned on this account. The tun seems to suffer from the attack of a moth caterpillar, which eats the pith of the shoot just as it is the case in Chánga Mánga. Monkeys are reported to be so destructive to shisham seed as to render it difficult to collect any.

The expenditure may thus be summarized:

Maintenance	... ...	Rs. 367
Planting work &c.	... ...	„ 47
Collection of wood	... ...	„ 497
	Total ...	„ 911

Receipts:—

Sale of wood and grass	... ...	Rs. 5,756

55. *On the Delhi and Gurgaon works* only 53 were spent in maintenance, nearly Rs. 1,405 (out of a total receipt of Rs. 1,695) were derived from sale of trees, on the old bund of the Najafgarh drainage cut. It is not stated whether this relate to thinnings, or to trees blown down by storms, or what.

B. H. BADEN-POWELL,

Conservator of Forests, Punjab.

Arboriculture statement of the Punjab districts for the year 1877-78, (*vide Financial Commissioner's Circular No.* 42, *dated 4th June* 1878.)

Tahsil.	1	2	3	4	5	6	7	8	9	10	11
					Going over or completing old work.			New work.			
	Serial number.	Name of road or locality, (total length in miles omitting fractions given in bracket.)	Number of miles still unplanted or planted, but failed altogether.	Work of previous years which still requires completion.	Success.	Partial success.	Failure.	Success.	Partial success.	Failure.	Remarks.
					Peshawar.						This form has not been made use of.
					No return.						38,974 trees were put out along the roads in the district.
					Kohat.						
					No return.						
					Hazara.						
Abbott-abad ...	1	Length of road in Tahsil (...)	5	1	643 trees. ...		80 trees.	2 miles.	...	225 trees.	Out of the 2 miles undertaken.
Haripur ...	2	Ditto (...)	11	4	350 „ ...		350 „	...	...	...	
Mansera ...	3	Ditto (...)	3	9	600 „ ...		340 „	...	...	...	Runs through the Pakli plains.
					Bunnu.						
					No return.						
					Dera Ismail Khan.						
					No return.						

					Dera Ghazi Khan.						
D. G. Khan ...	1	Length of road in tahsíl (174)	169	...	...	...	...	4	7	...	
Jampur ...	2	Ditto (40)	34	...	...	...	...	...	6	...	
Rájanpur ...	3	Ditto (11)	...	...	...	...	...	11	...	...	
	4	6 nurseries on different roads.	...	...	...	...	...	5 or 6000 shisham plants.	...	...	
		2 small plantations in the Kotla Sikhani Rakh.	...	...	...	...	...	Some thousand of shisham plants.	...	...	It is intended to plant the whole area of this rakh with shisham.
					Rawalpindi.						
					No return.						
					Jhelum.						
Jhelum ...	1	Length of road in tahsíl (31½)	23	8	2⅛ Miles, 460 trees		54	...	...	...	
	2	New bazar (½)	½	...	...	...	...	280	...	30	
	3	Bund at Jhelum town ...	2½ furlong	...	...	...	...	101	...	4	These are shisham trees.
	4	Jhelum public garden ...	10 acres	...	...		...	...	...	...	
P. D. Khan ...	5	Length of road in tahsíl (...)	16 miles	15	873	...	177	...	...	...	Various fruit and ornamental trees planted.
Chakwál ...	6	Ditto (8)	6	2	484	...	...	...	2 miles	...	A 2 acre nursery in this tahsíl is now ready for supplying trees.
Talagang ...	7	Ditto (...)	63	7⅐ mile	1,109	...	...	...	...	...	
	8	Tánk ...		...	154	...	...	...	...	...	A nursery of one acre has been made for future work.
					Shahpur.—(*road avenues*).						
					Mile. Trees.						
Bhera (dry 15 inches).	1	Wazidi to Badshapur (38)	15	23	9 1,314	...	...	...	...	...	To fill gaps.
						Mile. Trees.				Miles.	
Khushab (dry 15 inches).	2	Length of road in tahsíl (177)	120	57	32 32,105	18 8,400	...	...	...	1-9 and 1-15	Failed for drought.
Shahpur (dry 16 inches).	3	Ditto (9¼)	5	4¼	4 1,550	...	...	3 miles single row either side.	...	...	2,550 kikar and shisham trees employed.

Arboriculture statement of the Punjab districts for the year 1877-78, (*vide Financial Commissioner's Circular No.* 42, *dated 4th June* 1878)—continued.

Tahsil.	1	2	3	4	5	6	7	8	9	10	11
					Going over or completing old work.			New work.			
	Serial number.	Name of road or locality, (total length in miles omitting fractions given in brackets.)	Number of miles still unplanted or planted, but failed altogether.	Work of previous years which still requires completion.	Success.	Partial success.	Failure.	Success.	Partial success.	Failure.	Remarks.
					Groves or plantations in this district.						
Bhera ...	13	Near Bhera tank ...	1¼ kanáls	...	...	...	...	200	...	...	Seedlings of kikar and shisham.
	14	Bhera rest house compound	...	...	...	...	...	86 trees	...	...	Mangoes.
	15	Bhera tank garden ...	...	...	...	...	...	260 "	...	...	
	16	Bhera camping ground ...	...	...	...	...	...	40 "	...	...	
	17	Bank of Rániwah canal ...	...	...	...	...	...	114 "	...	...	
	18	Lahore and Deraját road...	...	...	...	...	...	...	...	35 small groves.	Kikar sowing failed from drought.
		(Between Samránwáli and Tálihwáli.)	...	...	...	...	...	...	...	...	
Khusháb ...	19	Sakesar hill ...	...	...	...	...	...	11,000	...	1,000	Shisham, mulberry and pipal ; 1,000 pipal failed, killed by an unusual fall of snow.
	20	Khusháb tahsíl plot ...	2½ acres	(Has a few trees from former years).				560	...	...	Kikar seedlings.
	21	Camping ground at Kund,	...	...	...	...	...	1,300	...	...	1,000 kikar and 300 "fruit trees."
	22	Plot at Kathwái ...	...	...	...	...	...	950	...	...	Of which 250 were "fruit trees."
	23	Camping ground at Katha,	...	...	...	...	...	800	...	...	Of which 300 were fruit trees.
	24	Sodhi garden ...	...	A garden planted in previous years.	2,500 trees			...	...	...	Fruit trees, shisham and tún.
	25	Camping ground Hadálí ...	...	...	...	...	...	...	...	500	Kikar and bér failed in sandy soil.
	26	Small groves along road from Khusháb to Nurewála.	10 in number.	(only a few trees remain.)	3 groves or plots.	4 Ditto	3 Ditto	...	...	...	
Shahpur ...	27	Tahsíl garden ...	3¼ acres	...	...	...	...	450 trees	...	...	Kikar.
	28	Stallion stable compound...	...	...	...	...	...	65 "	...	...	

		29	Sadr dispensary compound,	...		...	...	...	...	25trees	...	...	
		30	Police lines ...	...		(a few trees from former years.)	150	...	...	...	...	...	Kikar.
		31	Dák bungalow compound,	...		...	...	...	...	150 „	...	...	Do.
							GUJRAT.						
Gujrát	...	1	Gujrát to Bhimbar (24) ...	...		24 (as there are a few gaps throughout)	6 miles, (mile 1-6?)	...	...	...	...	...	Young trees were *fenced*, restoration of fences in two other roads was also undertaken.
							GUJRANWALA.						
							No return.						
							LAHORE.						
							Mile. Trees.						
Sharakpur	...	1	Length of road in tahsíl(70)		55	15	13 3,436	...	...	...	...	...	Mostly shisham. I have omitted the rain-fall as it seems to be wrong. Lahore is given as arid *i. e.*, less than 15 inches (only 82.)
Lahore	...	2	Ditto (15)		4	11	4 2,500	...	...	...	...	...	Blanks filled.
Chunián	...	3	Ditto (67)		40	23	15 ...	...	...	3 miles	...	...	Gaps filled.
Kasur	..	4	Ditto (16)		10	6	10 3,956	...	...	...	...	...	
							(LAHORE.—*Groves &c.*)						
				A. R. P.									
Sharkpur	...	5	Near tahsíl ..	2 1 19		(500 trees	from old so'wings.)		...	2 roods 26 poles.	...	...	Including 170 fruit trees.
			Plot near school ...	0 2 27		...	...	...	...	86 trees.	...	...	
			Camping ground near tahsíl		...	...	...	...	...	...	...	...	
			At a well between Míránpur and Jaláli.		...	...	...	...	...	70 trees.	...	...	
			At a well between Shekhopura and Marh.		...	...	...	...	...	Groves $\frac{1}{7}$ acre.	...	...	
							FEROZEPORE.						
						No	return—(*see* narrative		remarks.)				
							AMRITSAR.						
Amritsar and Ajnala.		1	Total length of roads (131½)		82½	54	1,592 trees	764	345	976	70	135	

Arboriculture statement of the Punjab districts for the year 1877-78, (*vide Financial Commissioner's Circular No.* 42, *dated 4th June* 1878)—continued.

Tahsil.	1	2	3	4	5	6	7	8	9	10	11
					Going over or completing old work.			New work.			
	Serial number.	Name of road or locality, (total length in miles omitting fractions given in brackets.)	Number of miles still unplanted or planted, but failed altogether.	Work of previous years which still requires completion.	Success.	Partial success.	Failure.	Success.	Partial success.	Failure.	Remarks.
					Sialkot.						
Siálkot ...	1	Length of road in tahsíl(70)	5½	54	19 miles	...	...	...	...	...	
					Miles Trees						
Reya ...	2	Ditto (32)	...	32	29 6,500	2 miles	...	...	...	...	
Pasrúr ...	3	Ditto (133)	29½	19½	...	103 „	...	...	...	...	
Zafarwál ...	4	Ditto (75)	18	Blanks throughout.	21 2,959	...	..	...	...	...	
Siálkot ...	5	Karlup bund on the road..	...	...	...	...	...	3 miles	...	...	Single row of trees, very few failures
					Gurdaspur.						
Shakargarh ..	1	Length of road in tahsíl(36)	12	...	...	...	...	8 miles	...	6½ furlongs	
Gurdáspur ...	2	Ditto (72½)	6½ miles	...	...	...	...	6½ „	...	...	
Batála ...	3	Ditto (23)	30 poles	30 poles	...	...	...	...	...	...	
				Miles poles	Fur. poles		fur. r. p.				
Pathánkot ...	4	Ditto (14)	...	6 20	3 4	...	6 4 16	...	...	...	Cause of failure not stated.
					Gurdaspur.—(*Groves and gardens*).						
				rood poles							
Shakargarh ...	5	Plot at back of tahsíl ...	...	1 20	1 rood completed.	...	20 poles	...	...	...	It is supposed that the planting up of these gardens was completed this year having been partly accomplished before.
Gurdáspur ...	6	Nursery near Seráí ...	...	2 ...	2 do. do.	...	...	...	...	...	
	7	Do. near Dák Bungalow	...	30 poles	30 poles do.	...	...	...	...	...	

	8	Government garden at Sadr	...	26 acres	26 acres	...	...	...	...	...	
	9	Do. near Sessions house.	...	17 2 0	17 2 0	...	...	...	...	...	
	10	Tahsíl nursery ..	...	3 0 0	3 0 0	...	...	...	...	...	
	11	Kutchery compound ...	...	3 0 0	3 0 0	...	...	...	...	...	(A nursery of tun trees.)
	12	Ditto ...	...	3 0 0	3 0 0	...	...	...	...	...	A nursery of mangoes.
Batála ...	13	Tahsíl garden ...	...	3 0 0	3 0 0	...	...	...	...	...	
Pathánkot ...	14	Ditto ...	...	3 0 0	3 0 0	...	...	...	...	...	
					JULLUNDUR.						
			Miles	Miles	Miles	Miles					
Jullundur ... (medium 32 inches)	1	Length of road in tahsíl (33¼)	6	19¼	10	8½	...	...	...	...	Blanks filled with trees.
Nawashahr ... (medium 26 inches.)	2	Ditto (10½)	4½	6	5½	½	...	...	...	...	
								miles			
Phillour ... (medium 31 inches.)	3	Ditto (40½)	10	8	...	...	...	2	...	...	Single line on either side kikar and mulbery.
Nakodar ... (medium 21 inches.)	4	Ditto (10)	...	...	...	...	...	1	...	...	The 4th mile with shisham on both sides.
					(*Groves and nurseries.*)						
Nawashahr ...	5	Nursery near Bárádarí Garden.	30 poles	...	...	...	...	20 poles	...	10 poles	With 1,000 cuttings failed.
	6	At Seráí ...	...	...	...	...	...	400 trees	...	...	Shisham.
				roods poles							
Phillour ...	7	Camping ground nursery...	½ acre	2 30	blanks filled up.	...	...	1 rood 15 poles.	...	...	With shisham cuttings.
					HOSHIARPUR.—(*see* narrative).						
								Miles Trees			
		In Hoshiárpur tahsíl ...	...	...	1,542 trees to fill blanks.			2 1,003	...	...	The totals for tahsíl are given only
		„ Garshankar do. ...	...	...	2,022	do.	...	...	...	...	
		„ Dasúya do. ...	...	...	9,762	do.	...	...	...	...	
		„ Una do. ...	...	...	226	do.	...	3 1,100	...	...	
		„ Amb do. ...	...	...	153	do.	...	3 480	...	...	

Arboriculture statement of the Punjab districts for the year 1877-78, (*vide Financial Commissioner's Circular No.* 42, *dated* 4*th June* 1878)– continued.

Tahsil.	1	2	3	4	5	6	7	8	9	10	11
					Going over or completing old work.			New work.			
	Serial number.	Name of road or locality, (total length in miles omitting fractions given in brackets.)	Number of miles still unplanted or planted, but failed altogether.	Work of previous years which still requires completion.	Success.	Partial success.	Failure.	Success.	Partial success.	Failure.	Remarks.
					Kangra.						I understand the entries in the District table to mean what I have entered here. I cannot classify the tahsils as there is some mistake. Nurpur is entered as dry with a rainfall of 1.059 inches.
			Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles	
Núrpur ...	1	Length of road in iláka (87)	44	43	24 completed with 500 trees	19	...	...	...	...	
Kángra ...	2	Ditto (77)	32	45	41 1,805	..	...	...	...	...	
Dera ...	3	Ditto (100)	55	45	8 593	7	30	...	...	...	In Dehra the failure of repairs carried over 30 miles was due to rain not following the planting out. In Hamirpur the new plantings were of double lines on both sides and of single line on one side (reckoned therefore as partially complete) 5 miles.
Hamírpur ...	4	Ditto (127)	87	40	23 933	11	6	4	5	2	
Pálampur ...	5	Ditto (66)	40	26	26 repaired	....	...	...	...	...	
					Groves &c.						
Kángra ...	6	MacLeod Gunj nursery ...	2 roods contain	4,000	deodar seedlings.		...	4 mds. deodar seed sown.			
Pálampur ...	7	Tahsíl compound ...	20 poles do.	2,000	do.		...	1 do.	do.		
Dera ...	8	Dera ...	15 poles contain	mango	mulbery and tun.		...	Sowings.	...	...	
Núrpur ...	9	Núrpur ...	30 do.	d	do.		...	10,000 mulbery cuttings from Mádhopur,	...	...	
Kulu ...	10	Sultánpur (tahsíl) ...	10 do.	do.	and deodar.	...	...	180 English trees	...	30 trees	
					Ludhiana.						
					Miles			Mile			
Ludhiána medium (33 inches.) ...	1	Length of road in tahsíl (42½)	...	7½	25	...	...	1	...	...	(The 10th) with 500 trees.

Jagraon ... (dry 11 inches.)	2	Length of road in tahsíl (39½)		19½	19½	...	...	5 miles with trees	...	...	Blanks filled with trees.
Samrála ... (dry 20 inches.)	3	Ditto (15½)	1	...	Blanks filled with 500 trees.			1 mile	...	...	Double row 500 trees.
					UMBALLA.						
			No work except maintaining the old work done during the year.								
					MOOLTAN.						
			Miles		Miles		Miles				
Mooltan ...	1	Total length of road (61)	31	30 with blanks	8 blanks filled		12	...	...	...	...	The original return gives a large number of existing roads which however the year's work did not touch. An abstract is given of the roads dealt with.
Lodhrán ...	2	Ditto (129)	70	59	1 do.		57	...	...	...	...
Shujabad ...	3	Ditto (39)	35	4	...		4	...	...	...	...
Mailsi ...	4	Ditto (102¾)	66	36¾	8 ...		27¾	...	...	...	...
Serái Sidhu ...	5	Ditto (80)	37	43	...		8	...	9 miles	...	...
					(*Groves and nurseries.*)						
									trees		
Shujabad ...	6	Shálamár garden ...	...	...	...	...		...	1,998	...	...	In a few places one or two trees were planted only; these are omitted.
				200 trees planted							
Lodhrán ...	7	Garden at Lodhrán ...	...	½ failed	100 to fill blanks...			...	...	...	...
Serai Sidhu ...	8	Do. at Serai Sidhu ...	...	...	...	...		...	2,000	...	...
Mailsi ...	9	Do. at Mailsi ...	...	...	...	..		...	623	...	...
Mooltan ...	10	At Dak Bungalow ...	...	162 trees planted, of which 142 died.	142 trees replaced.			...	...	...	...
					MUZAFFARGARH.						
					No return.						
					JHANG.						
					trees						
Jhang ... (dry 16 inches.)	1	Length of road in tahsíl (101)	91¾	9¼	2,012	...		...	...	...	...
Chiniot ... (arid 14 inches.)	2	Ditto (52)	50	51 miles	155	...		...	...	...	...
Shorkot ... (arid 13 inches.)	3	Ditto (34)	32	27th & 33rd	141	...		...	...	...	...
					(*Groves &c.*)						
			Acres								
Jhang ...	4	Garden near kutchery ...	5	...	...	...		...	1 rood	...	...	Planted with 2,500 trees.
Chiniot ...	5	Garden at tahsíl ...	5	...	...	..		...	5 poles	...	..	Ditto 292 do.
Shorkot ...	6	Ditto ...	2	...	...	...		...	8 poles	...	...	Ditto 579 do.

Arboriculture statement of the Punjab districts for the year 1877-78, (vide Financial Commissioner's Circular No. 42, dated 4th June 1878.—concluded.

Tahsil.	1	2	3	4	5	6	7	8	9	10	11
	Serial number.	Name of road or locality (total length in miles omitting fractions given in brackets.)	Number of miles still unplanted or planted, but failed altogether.	Work of previous years which still requires completion.	Going over or completing old work.			New work.			Remarks
					Success.	Partial success.	Failure.	Success.	Partial success.	Failure.	
					Montgomery.						
Dipálpur ...	1	Total length of road ...	32	...	...	...	...	...	...	6 miles	4,400 trees died.
					(*Groves &c.*)						
					Trees		Trees	Trees			
Montgomery ...	2	Chichawatni Dak bungalow ...	...	(111 trees existed)	40	...	10	...	...	...	
	3	In the station ...	...	4,150 do.	2,936	...	634	...	...	...	
Gogaira ...	4	At 8 different wells ...	...	...	...	...	...	1,844	...	...	
Dipálpur ...	5	Attári plot ...	9 acres	...	...	...	...	1,019	...	...	
					Hissar.						
				No return received—(*see* narrative report.)							
					Rohtak.						
					(No return received.)						
					Sirsa.						
					(No return received.)						
					Karnal.						
					(No return received.)						
					Gurgaon.						
				No return received—(*see* narrative report.)							
					Delhi.						
					(No return received.)						